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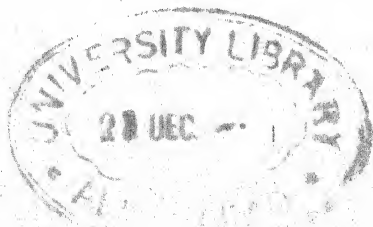
AN INTRODUCTION TO THE ECONOMIC
HISTORY OF THE UNITED STATES

by

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Preface

THE GUILD OF ECONOMIC HISTORIANS sets no rigid qualifications for membership within its ranks; it welcomes and, indeed, must draw extensively upon the contributions offered by students and scholars of the most diverse interests and talents. It asks of its fellows only that they remember the main objective of their association: to promote a clearer understanding of how man's struggle for material existence has been carried on through time. By this standard the economic historian's claim to journeyman's or master's status will be judged. In this book on American economic history, the authors have consistently followed the precepts of honest craftsmanship. They have subordinated all other considerations to the main task of describing and analyzing the changes that have occurred in the wealth-getting and wealth-using activities of the American people. Only incidentally has attention been given to the influence of our economic development upon allied fields of legal, political, intellectual, or general social history—matters which, while of great interest, should not be considered in detail in an introduction to economic history.

In its entirety, American economic development has been exceedingly complex, extending roughly over three centuries and encompassing the lives of millions of persons with economic activities subdivided into dozens of major occupations, hundreds of specialized branches, and thousands of enterprises. The manifold changes in these various phases of American life have been so uniquely conditioned that only specialized study can give an adequate explanation of their evolution. For this reason it is doubtful if any one person can ever treat with authority all the topics that should be included in a survey book in American Economic History. A really adequate treatment must draw upon the knowledge of scholars who have worked intensively in particular areas. Such is the plan followed in this volume. Each author has been chosen because of his special competence in the field about which he has written. Each chapter represents the balanced judgment of a person who has made a careful monographic study of his subject and who is therefore intimately acquainted with its details.

A wealth of material necessitates careful choice of subject matter for an introductory text on American economic history. It is impractical to include anything more than those topics that give the beginning student a knowledge and understanding of the major trends in the evolution of our economic institutions. Emphasis has therefore been placed

upon the analysis and interpretation of the more important trends. The facts of our economic history have been lifted from their resting places in documents, census reports, monographs, and the like, and their meaning and significance illuminated. Finally, developments in the major subdivisions of our economic life have been synthesized by giving specific attention to measuring the adaptation and performance of the economy as a whole.

No attempt has been made to set precise chronological divisions in the treatment of the material. For the most part the chapters fall within the three conventional periods, the Colonial, the years before the War Between the States, and the era after the war. Where it has seemed desirable for purposes of logical development, however, the authors have not hesitated to extend their treatment across these divisions. In the case of Public Finance (Chapter 29), it seemed most advantageous to bring together the whole story since 1789 within a single chapter. In general, the narrative has not been carried beyond the middle 1930's. Events since that time are too recent to be accurately judged by any proper historical perspective.

I take this opportunity to express my indebtedness to the twenty-five scholars who have co-operated in the writing of this book. The ideas and suggestions for the plan of the work that members of the group contributed were most helpful. All the contributors have worked under severe handicaps, since most of the writing was done under the pressure of heavy alternative demands on their time arising from accelerated academic programs or from service with the Government. Special acknowledgment must be made to Major E. A. J. Johnson, whose experience and judgment proved invaluable at every stage of the volume's preparation. Responsibility for the general organization and for the content of the book must, of course, be assumed by the editor.

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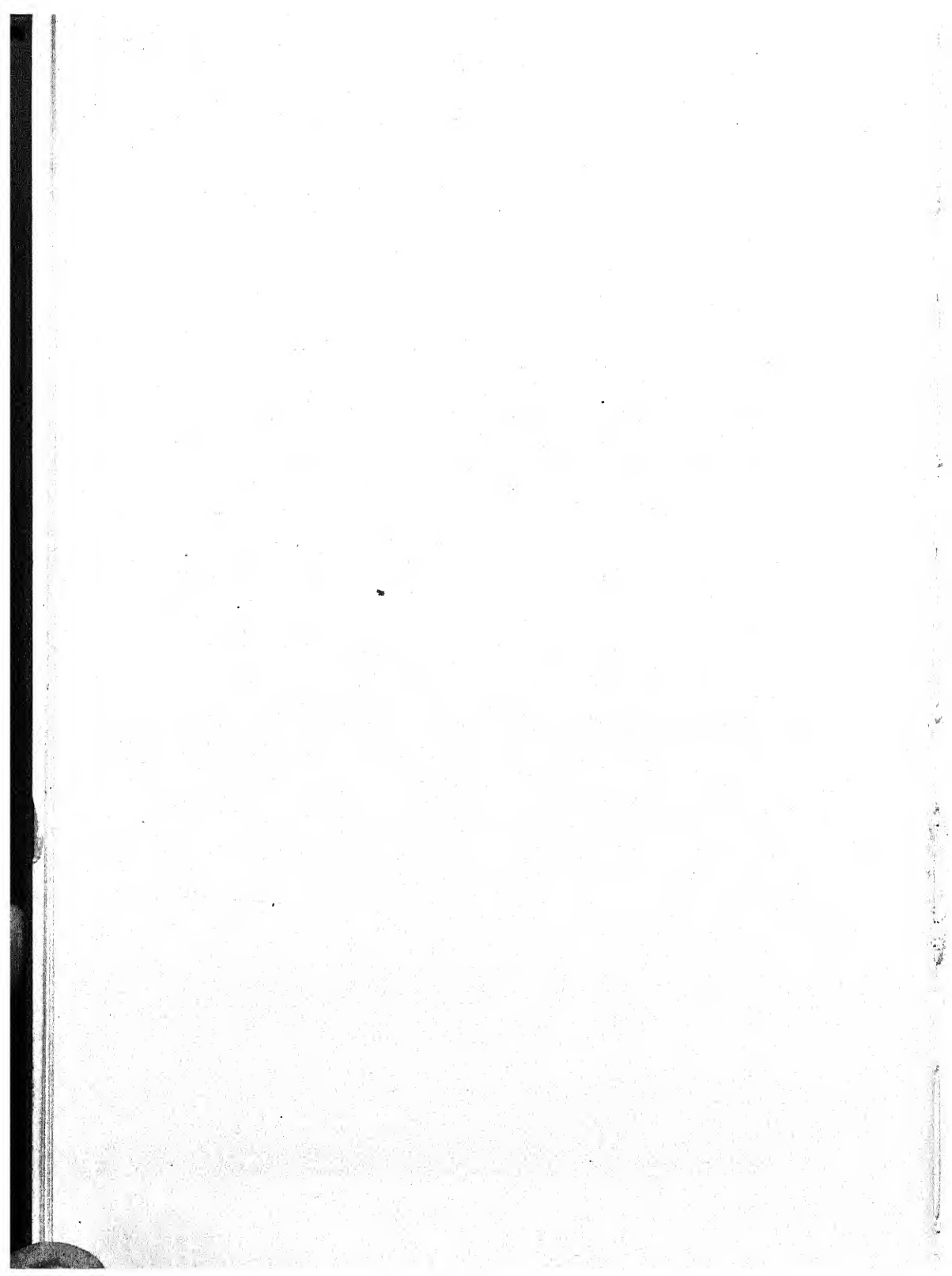
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CHAPTER 1

Introduction: Nature of Economic History

EXCEPT IN THOSE RARE COUNTERPARTS of the Garden of Eden, found principally in the realm of imagination, human beings have always faced the stern reality of limited resources with which to satisfy their seemingly endless needs and wants. Economic history tells the story of the ways by which men have attempted to overcome these limitations imposed by nature, and describes the uses made of the products of their efforts. Discovery of new resources and development of more effective methods of utilizing those already known have made possible an existence well above a subsistence level for a considerable part of the human race; moreover, this improvement has challenged man's ingenuity to extend these benefits to a larger proportion of mankind. But the record of economic history is often less roseate: exhaustion or waste of resources and failure to discover ways of relieving scarcity have reduced or kept incomes below comfort levels for great masses of people and have brought on the tragedies of malnutrition, starvation, and associated evils.

Interest in economic history naturally centers upon the factors that make for change. What are the dynamic elements in economic development? What are the conditioning circumstances that encourage or inhibit change? What forces lead to particular forms of economic institutions? Answers to questions of this type are the principal concern of the economic historian.

In its entirety the process whereby economic institutions emerge is complex, but fortunately the main outlines are reasonably clear. Some capacity to devise different ways of doing things is apparently widespread among members of the human race. If, for any reason, there is dissatisfaction with methods currently in use, new devices will be sought, although the extent to which such attempts will succeed depends in turn upon the conditioning influences of physiographic and social factors. Innovations may die "aborning" if the social environment into which they are ushered is apathetic or openly hostile to disturbance. Contrariwise, they will be given encouragement if current philosophies accept or welcome change—if institutions are flexible and adaptable. Moreover, the capacity for innovation itself will be influenced by the degree to which educational institutions have made general scientific knowledge available. Nor should it be overlooked that physical environment may present an opportunity for the expression of man's ingenuity or may severely limit his attempts in this direction.

Economic development, then, shows the combined effect of physical environment, technology, and social institutions; each of these factors plays a distinctive part in the process of historical evolution.

The Physical Environment

Physical environment may be described as the stage upon which men work and live, since within the limits set by this stage the problems of material existence must be worked out. These limits, however, are by no means unchanging; indeed, even permanent features of geography acquire new meaning through increased knowledge and discovery. The ocean, for example, may at one time present a formidable barrier to movement, whereas at another date it may be used as a convenient highway of commerce and human migration. Physiographic features themselves are subject to modification. Some physical variations, like long-run weather cycles, arise out of circumstances quite divorced from human action, while others result from the efforts of man himself.

So apparent are the conditioning effects of physical environment upon the economic organization of societies that it is easy to exaggerate its influence. The relations really involved may best be described by saying that geography sets the boundaries within which economic development *can* take place. Man is no passive agent, forced to adapt himself to circumstances rigidly determined by his physical surroundings. He has the power to choose among existing alternatives; even more important, he has been able to mold his environment to meet his needs. One eminent geographer has stated the issue very clearly: "There are no necessities, but everywhere possibilities; and man, as the master of these possibilities, is the judge of their use."¹ Thus an understanding of the limits imposed by physical environment on economic development and of the range of possibilities within those limits is especially helpful in accounting for the economic relations between regions and in explaining the details of organization within areas at particular periods. An analysis of the relative industrial growth shown by countries at specified dates, for example, can best be approached by reference to the geographic potentialities involved. But the most comprehensive understanding of the physiographic elements in a region will not shed much light on the question as to why a particular set of economic institutions emerged, nor will it explain the timing of their appearance. Only by reference to other material can a more complete explanation be obtained.

The Role of Technology

It is principally through technical innovations that men have been able to utilize and adapt their physical environment more effectively

¹ L. P. V. Febvre, *Geographical Introduction to History*, p. 236. New York: Alfred A. Knopf, 1932.

to satisfy their material needs. It is no exaggeration to say that new discoveries relating to technology have constituted the most important single factor leading to modification of economic organization; indeed, it has been claimed that invention is the greatest general cause for change in our modern society.

Until fairly recent times it was supposed that improvements in technology sprang fully developed as a result of a mysterious mental activity of a few highly gifted persons whose appearance in society was quite unpredictable. Modern studies have shown this older view to be incorrect in several respects. The mental processes involved in innovations are quite similar to those exercised by most people in the ordinary business of living. The innate capacity to solve more complex problems in connection with inventions is probably distributed among populations according to some approximation of a normal curve of probability. Furthermore, innovation is a cumulative process: inventions are closely related to previous discoveries, and are therefore a result of an evolutionary rather than a revolutionary process.

Technical innovation or invention consists in the establishment of relations that did not previously exist. Essentially it is a new combination of old ideas. Many problems connected with everyday life require mental activity of this sort for their solution. Most persons, however, limit their innovating activity to a fairly simple level—to areas where the problems are not very complex and where the immediate objectives are fairly obvious. Considerable effort is involved in deviating very far from established channels of thought. Hence, the solution of more difficult problems requires the attention of a relatively small group whose imagination and training are more highly developed.

Although the psychology involved in the process of invention is by no means simple, some of the principal steps may be distinguished. The initial step comes with a feeling of dissatisfaction with the results of techniques currently in use. This feeling may arise out of a recognition that contemporary methods are providing an inadequate supply of familiar kinds of goods, or that they are incapable of being used for the production of new products. If the sense of dissatisfaction is sufficiently strong, a second phase of the inventive process will occur in attempts to solve the problems involved in improving current methods of production. In all but the simple situations, this second step will necessitate the attention of persons especially qualified by training or experience to solve the particular kind of problems involved. This is why inventors often tend to specialize in certain types of work; this is why improvements are often made by workmen intimately acquainted with certain technical processes.

The total experiences of many inventors suggest a third step in the mental process of innovation. Numerous firsthand accounts tell of the

"flashes of inspiration" that have marked the successful solution of the particular problems. As Professor Usher has indicated, some "stage setting" is necessary before the new combination of old elements can be visualized.² Such a setting may involve the use of physical properties or it may consist entirely in mental images. In either case, the proper combination may suggest the sought-for solution.

There may be a considerable interval between the moment that an invention takes form in the mind of its creator (or is embodied in a working model) and the time that it begins to have any effect on economic life. Practically all important technical innovations have had to go through a long period of testing and modification before the basic ideas could be put into workable form. Difficult mechanical problems must often be solved; moreover, in some instances, successful operation may have to wait until allied techniques have developed.

As a rule, the lines along which technology develops will depend to a considerable extent upon the nature of the problems facing innovators. Their attention will be directed to overcoming those obstacles that seem most important and urgent. Where raw materials are scarce and labor abundant, as in Germany, efforts are likely to be turned toward methods of obtaining greater or improved production from such raw materials. Where labor is relatively limited, as in the United States, attempts will be made to economize on its use by seeking "labor-saving" improvements. War or its threat turns the attention of scientists and inventors to the creation of instruments of destruction, although it should be noted that these may have important peacetime applications.

The Social Environment

The customs, mores, and institutions that form the social environment of a nation constitute the third set of factors that affect economic life, and they are, in turn, influenced by changes in technology and physical background. Like the physical background, the social environment may impose limits or may present opportunities for economic change. If it reflects a general attitude of veneration toward tradition and past accomplishments, the incentives for modifying current economic arrangements will be weakened merely because the attention of potential innovators will be directed toward channels less likely to disturb existing conditions. If, on the other hand, the prevailing philosophy accepts the idea that material advancement is both possible and desirable, encouragement will be given to forces making for improvements in existing techniques: inventors and innovators will be held high in public

² See A. P. Usher, *History of Mechanical Inventions*, pp. 18-19. New York: McGraw-Hill Book Company, 1929.

esteem; positive aid may be given in the form of patent rights, bounties, land grants, and other governmental assistance.

Disturbances in economic organization almost inevitably affect some groups in society adversely; others find their positions improved by the changes. Should those members who feel a strong vested interest in maintaining the *status quo* be able to translate their sentiments into legislation or social conventions, serious limitations will be imposed on change. This conservative effect, however, may be offset by those social groups whose interests appear to be best served by the adoption of innovations.

Even if there is a general acceptance of the idea that progress and change are closely associated and on the whole desirable, economic development will be influenced by the skill with which laws and customs are adapted to meet the requirements imposed by technical change. A legal framework that is well suited for an agricultural or commercial economy may work badly when applied to an industrial organization. New techniques like the introduction of railroads or the generation and distribution of electric power may present problems of social control unknown to previous generations of lawmakers. The part played by legislators and statesmen in economic development is especially significant. Their actions will determine to a very considerable extent the usefulness that any particular innovation or series of technical changes has for a society. Specifically, their function is to see that the potentialities of innovations are directed toward given social goals. The principal mental quality needed is that of judgment: the ability to choose from among a given range of possibilities the alternative that seems most desirable.

The interrelations between the social environment and economic factors present an extremely complex problem of analysis. Some scholars have attempted to explain the general character of society principally if not exclusively in terms of economic or technical considerations. This position seems untenable. That economic influences are important is obvious, inasmuch as a great part of man's social life is occupied with the problems of getting and spending a living. But it is fully as clear that social institutions are also influenced by intellectual and ethical concepts that are not dominated by material considerations. Political and religious philosophies, for example, are no simple reflection of economic organization, and hence their evolution may follow a relatively independent pattern.

A knowledge of the social environment will aid in understanding the type of economic organization to be found at a particular period of time as well as in explaining why particular forms came into existence. But it is important to bear in mind that social factors are only partly deterministic in their effect on economic life, since they are subject to modification by geography and technologies.

The American Physical Environment

Even the most imaginative of the early explorers could hardly have visualized the economic potentialities of the territory that was eventually to come within the boundaries of the United States. Measuring roughly 3,000 miles across and 1,000 miles from top to bottom, without counting Alaska, the continental area of our country presents an expanse of heroic proportions. A bird's-eye view of its more important external features would show a fairly narrow coastal belt along the Atlantic Ocean separated from the broad valley of the Mississippi by the Appalachian Mountains. Westward from the 100th meridian, the terrain rises rapidly to include the peaks, high plateaus, and valleys of the Rocky Mountain region extending to the Pacific Coast. Along the heavily indented Atlantic Coast are numerous rivers flowing down from the mountains. To the west, the Mississippi River, with its important tributaries, the Ohio and the Missouri, drains the great valley to which it gave its name. Farther to the west are the Columbia and the Colorado and the San Joaquin-Sacramento waterways. The five Great Lakes in the northeast, with their outlet to the Atlantic by way of the St. Lawrence River, would complete a quick survey of some of the more apparent physical features.

A somewhat closer inspection of the terrain would show about 130,000,000 acres of virgin timber, all that is left of some 800,000,000 acres that originally extended from the Atlantic Coast to the plains beyond the Mississippi and in the Pacific Northwest. Approximately one-half of this original forest area has since been converted into farm land and pastures, while over 250,000,000 acres have been cut over or burned and either lie barren or at best support an irregular growth of trees, often of inferior species, mute testimony to the careless use of a valuable natural resource.

West and south of the timber regions the observer would note the Great Plains. Originally covered with short grass and once the home of great herds of buffalo, much of this area has been put to the plow. But whenever a rainfall cycle reaches its lower levels, the region becomes a spectacular dust-bowl, scattering its soil over thousands of miles and bringing ruin to large numbers of its inhabitants.

Yet these more obvious relief features of the country do not reveal other physiographic features that have been even more significant for American economic life. The entire area falls within the temperate zone and for the most part possesses a climate ranging within limits most conducive to the exercising of human effort. Except in a few places along the Gulf of Mexico and in the desert regions, temperatures do not reach the extremes that tend to sap man's energy.

Crop-growing seasons range between four months in the north and ten months in the southern parts of the country. From the 100th meridian eastward and in the Pacific Northwest, the annual average

rainfall varies between 20 and 60 inches, which is sufficient for most agricultural products. In some of the more arid sections, notably southern California and some of the areas in the Rockies, it has been possible to supplement a relatively scant rainfall by irrigation projects. In respect to natural fertility suitable for crop raising, American soils range in quality from low to medium along the Atlantic Coast and in the South, to high and very high in the upper Mississippi Valley and areas west. The combination of excellent soil, favorable temperatures, and sufficient rainfall makes the Mississippi Valley, especially the northern part, one of the most favorable regions for agricultural production in the world.

An inventory of American mineral resources shows a particularly rich heritage. Except for tin and some of the alloy materials like chrome and nickel, the country is lacking in few essential items. Of outstanding importance are deposits of coal, "the world's most valuable mineral." These deposits include the only anthracite mines in the world; they are located in an area of approximately 500 square miles lying almost entirely within the borders of Pennsylvania. Of greater significance are some 500,000 square miles of bituminous coal fields, located principally in regions between the western side of the Appalachians and the 96th meridian. These bituminous fields have not only furnished Americans with one of their leading sources of energy in the past, but they constitute a vast reserve capable of supplying this mineral for centuries to come.

Scarcely less significant than coal are the iron supplies. Some iron ore is found in almost every part of the country, but the outstanding fields are located in the Lake Superior regions, where the ore lies so close to the surface that it can be dug out with steam shovels. It should be noted, however, that so much ore has been taken from the Lake Superior fields that reserves are not expected to last more than a few decades longer. In the future more iron ore will probably be drawn from deposits in Alabama, Wisconsin, Pennsylvania, New York, and New Jersey. To the foregoing must be added the rich copper deposits of Michigan, Arizona, and Montana; the oil fields of Pennsylvania, Texas, Oklahoma, and California; as well as sources of natural gas, bauxite, gold, silver, and a host of lesser mineral substances found in various parts of the country. Mention should also be made of water-power sites capable of generating substantial amounts of electricity.

This brief survey indicates only a few of the principal geographic factors that have had a part in influencing and shaping American economic development. On the whole, they formed a most favorable setting for economic expansion. Many of these resources, however, were largely untouched for a century or more after the first white settlers arrived. Not only was it necessary for political and military conquest to bring new areas under national control, but the exploitation of many of the

most important raw materials had to wait until their location was revealed by explorers and the techniques necessary for their use discovered by inventors.

The Changing Significance of the American Physical Environment

For the original settlers in the New World, the forests, the sea, and the soil were the most significant features of their new physical environment. The Colonists were able to transfer many of the techniques, crops, types of capital equipment, and attitudes from Europe and thus develop an economy quite different from that of the native Indians. But geographic factors offered new opportunities and set physical and economic limits to the accustomed kinds of activities. Fishing in the ocean probably presented the fewest difficulties of adaptation to the Colonists. Long known and used by Europeans, the fishing banks furnished an important food supply and an early export product, especially for New England. The forests presented both problems and opportunities. They had to be cleared away before any extensive agriculture could be undertaken; but the trees furnished materials for buildings, ships, tools, and the like, on a scale impossible in the mother country. In addition, charcoal supplied the fuel for the small but flourishing iron industry, and within the woods lived an abundant animal life that formed the basis of a profitable, if short-lived, fur trade.

Agriculture, by far the principal occupation of the Colonists, soon showed regional differences closely associated with localized soil and weather conditions. New Englanders found their land ill-adapted for the production of wheat, and consequently turned to the indigenous Indian corn for their chief cereal crop. Corn, in fact, became a leading product throughout the Colonies; but in New York, Pennsylvania, Maryland, and Virginia, wheat production became increasingly significant. In the Southern Colonies, especially in Maryland and Virginia, circumstances so favored the raising of tobacco that it became a staple at an early date.

One distinctive feature of life in the New World was the considerable degree of economic self-sufficiency that was practiced. Besides growing a large proportion of their own food supplies, most households provided the major part of their other wants, including clothes and manufactured articles. Physical features were partly responsible for this high degree of self-sufficiency. In the absence of a cheap method of providing inland transportation, only those who had easy access to the sea could engage in any advanced degree of economic specialization. As settlement moved farther into the interior, this problem became even more acute.³

³ It should be emphasized that "self-sufficiency" was only relative. Even the pioneers, cut off from most traffic, depended upon others for important items such as metal products, gunpowder, and the like.

The physical environment in the New World also had its effect upon social institutions. The development of land ownership may be cited. In some of the Colonies attempts were made to introduce forms of land tenure based upon the conditions of scarce land found in Europe. These efforts were on the whole unsuccessful. Land was so abundant and cheap that to collect fees or services for its use proved almost impossible.

The basic structure of the American economy remained largely unchanged up to the time when the Colonies broke away from England. To be sure, there had been modifications in economic life, but agriculture and commerce, with some embryonic forms of factory production, continued to occupy the principal attention of the population. More striking changes, however, were to occur within the succeeding half-century. The Louisiana Purchase in 1803 added an "empire" to the original territory. By 1840 expanded coastal trade, highways, canals, and the newly constructed railroads had decreased the comparative isolation of the previous period and had ushered in a new era of geographic and occupational specialization. Now the farm lands beyond the Appalachians could send their staples in increasing amounts to Eastern markets. In the South, tobacco, still an important staple, had abdicated in favor of the new "king cotton," which was expanding its domain to the Southwest. Agriculture continued to claim the services of the largest part of the population, but its domination had been weakened by the growing significance of industry. New Englanders, borrowing and developing the power-driven machinery of England, had taken the lead in American industrial development. The numerous streams in that area had acquired an added meaning as the source of power for operating the new apparatus. Already the potentialities of steam power were beginning to be appreciated, and experiments with coal pointed the way to the use of this energy-producing mineral on a scale but dimly perceived by contemporaries. Significant beginnings had been made by Eli Whitney, Simeon North, and others in the manufacture of interchangeable parts that gave added incentive to the development of new and cheaper methods of fabricating iron and steel, which in turn further encouraged the exploration for new sources of raw materials.

Another half-century saw further advance along both old and new lines. By war, negotiation, and purchase, the country's continental boundaries had been rounded out. Measured by the numbers living in rural areas, the size of the agricultural population had increased over two and one-half times from the figure of about 15,000,000 reported for 1840. The industrial population, however, as indicated by the number of urban inhabitants, had expanded even faster: in 1840 it included approximately 11 per cent of the total; by 1890, the percentage had increased to 35 per cent.

Both industry and agriculture had been vitally affected by the expanded transport system. In 1890 nearly 170,000 miles of railways

spread their network over the country. Agricultural regions far distant from waterways could now send their products to markets. Older producing areas in the United States and even Europe were feeling the effects of the newly cultivated land in the American "West" as wheat, cotton, and meat products poured into their markets in increasing quantities. Industry, too, was able to draw its raw materials from sources hundreds of miles away from processing points and markets. The railways and the expanded transport facilities on the Great Lakes had made it practical to bring the iron ore from the Lake Superior region to blast furnaces in or near the coal fields far to the East.

Probably the most outstanding changes in respect to resource utilization were connected with the expansion of industry and commerce and involved the growing use of minerals, especially coal and iron. Total annual production of coal, which in 1840 had reached about 1,000,000 tons, had expanded 138 times by 1890. Steam power generated by coal now drove most of the factory wheels and the locomotives. It supplied heat for factories, office buildings, and homes, and in the form of coke it had almost entirely supplanted charcoal as the fuel used to refine the iron ore and to produce steel. Iron production had also expanded greatly. The output of pig iron was a little under 300,000 (long) tons in 1840; in 1890 the total had reached a figure in excess of 9,000,000. Low-cost iron and steel made possible a wide use of machinery on the farms and in the factories.

By the end of the fourth decade of the twentieth century, Americans were not only using previously known resources on a greatly expanded scale compared with the exploitation a half-century before, but in addition they had tapped a bewildering array of materials unknown to earlier generations. The transportation system had received significant technical additions. Railroads still hauled the greatest volume of traffic, but they had been partly supplemented by trucks that made it economical to reach previously inaccessible areas. The domination of the railroads was much more seriously threatened in respect to passenger traffic. Private automobiles, aided by buses and airplanes, moved millions of individuals from place to place; moreover, motor transport had led to shifts in population that were worrying the urban landowners and city officials.

The expansion in the use of the internal combustion engine was made possible by the development of a new source of energy, petroleum. This product, which a few decades before was principally used as a hair restorer, was not only the principal source of lubricating materials, but supplied an estimated 30 per cent of the energy consumed in the United States in 1939.

It should be noted, however, that coal was still the principal source of power. Total annual production averaged approximately 400,000,000 tons during the later 1930's. Its efficiency had been greatly increased

through technical advances that produced a great deal more energy per ton than had been previously possible. Its use had been for industrial and domestic purposes, widened through the development of electrical generating and distributing plants.

Iron and steel likewise retained their dominant position as the chief mineral products used in the construction of machines and finished products. But other materials were being utilized, of which aluminum probably represented the most important. Its use now gave economic value to the deposits of bauxite. Meantime the science of chemistry had added other products to our economy, such as rayon, Cellophane, and plastics, and in so doing either expanded the employment of previously used raw materials or brought new resources into use.

American Technology

The principal differences between Colonial economic organization and the modern American scene are attributable to a large extent to the application of new techniques to resources. Americans have long recognized the leading part that technology has had in shaping their economic development. They have taken a justifiable pride in the accomplishments of native innovators and inventors, and the names of Whitney, McCormick, Howe, Bell, Wright, and Edison, to mention only a few, stand high on the list of honored national figures. While there has been some tendency to neglect the lesser figures whose accomplishments were not so spectacular or so well publicized as those of the popular heroes, the ability to solve technical and economic problems is generally believed to be quite widespread among the population. "Yankee ingenuity" is not thought to be confined to the New England region; it is expected to show itself in the factories, on the farms, or wherever new problems are faced. National pride should not hide the extent to which we have borrowed ideas from other countries. The first settlers brought with them invaluable knowledge and techniques developed in the Old World, and this source has never been cut off. Yet Americans can rightfully claim an important part in adapting borrowed ideas to meet local conditions and in contributing new techniques and discoveries to the world's knowledge.

Conditions in the New World favored the advance of technology and discovery. Frontier life presented many new problems for which there was little precedent to indicate the proper solution. Large supplies of raw materials offered the possibility of high rewards to the successful inventor who could make them available. The general character of American contributions to technology reflects the kind of problems that were met. Great distances to traverse, large unused resources, and a scarcity of labor give the key to much that has been typical of our technology. Whitney's epoch-making cotton gin is an example of a labor-saving device that was devised to reduce the great amount of effort

that had formerly been required to separate the cotton fiber from the seeds. American contributions in the field of agricultural implements,—plows, cultivators, reapers, harvesters—all helped to reduce the time and work required to prepare and cultivate the soil and harvest the crops. Technical advances in the field of transport have shown a response to a major need, as have the adaptations of many ideas borrowed from abroad. The case of the railroads may be offered as an example. With resources widely separated from markets or processing points, this country has had a particular interest in a cheap and flexible system of transportation. By the beginning of the nineteenth century, the problem of improving the existing road, river, and canal systems had become acute. Credit for the original combination of the railway and the steam locomotive goes principally to British innovators. But Americans quickly recognized the potentialities of this new type of transport and developed the railroad along lines that differed from the English and Continental roads. A comparative scarcity of capital and labor in America prompted an economy in construction. Whereas the British railways were free from severe curves and their roadbeds were nearly level, the engineers in this country initially built their lines much more to the contours of the country, and so-called hairpin turns were commonplace. America's contribution of a swivel truck to permit cars and locomotives to negotiate sharp curves grew out of the nature of our roadbed construction.

Probably America is best known for its contributions to the development of mass-production methods. This development also shows the desire to conserve on labor. Eli Whitney, Simeon North, Samuel Colt, and other Americans share the credit with certain British inventors for the early use of the system of interchangeable-parts manufacture, which is the basis of large-scale production. Begun in the field of firearms, this method of manufacture spread to other parts of industry, receiving one of its most notable results in the manufacture of automobiles and, more recently, of airplanes.

Much of the experimentation by early American innovators was done on an empirical basis. Many improvements in technique were made by mechanics, laborers, and farmers working largely without the benefit of theoretical background. Even well-known inventors like McCormick and Hussey apparently brought little more than a native mechanical ability to the problems of developing a mechanical reaper. But this lack of scientific knowledge should not be exaggerated. Whitney, for example, brought to his work a formal education that included a familiarity with scientific principles; Oliver Evans was familiar with the current literature dealing with the theoretical aspects of the steam engine; and Thomas Jefferson is credited with working out a mathematical formula that could be used to give an efficient contour to the mold board of the

plow. As educational opportunities expanded, experimentation tended more and more to gravitate into the hands of specially trained operators and away from the workshops, factories, and farms and into the laboratories. In this change, the individual inventor began to lose his identity. Modern research is carried on chiefly by specially trained scientists working as teams in laboratories supported by educational institutions, research foundations, industry, and government. The millions of dollars spent annually by these organizations and the extensive interchange of newly discovered scientific information have no doubt speeded up the rate at which innovations can occur.

The American Social Environment

The American social environment has evolved out of many diverse influences. Native or indigenous aspirations have combined with ideas drawn by successive generations from Europe. The resulting philosophies have affected the nature of American institutions and have, in turn, been greatly modified by the economic and physical environment of the New World. On the whole, it may be said that our social environment has been favorable to a rapid expansion of the economy and to a vigorous exploitation of our resources. There has been rather little in the congeries of customs, institutions, and philosophies that would discourage the activities of explorers, innovators, or inventors, or of that larger group, the entrepreneurs or businessmen, that turned the former's discoveries to account.

It should not be supposed, however, that resistances or impedimenta have been absent from the American scene. New processes and ideas not uncommonly had to overcome prejudice and inertia or the antagonism of vested interests. Oliver Evans, for instance, had to meet the initial conservatism of the millers of his day before his improved flour-milling apparatus was accepted; Eli Whitney was forced to some extent to develop automatic machinery to perform the jobs that his skilled workers would not undertake; the early railroad promoters had to combat the interests of turnpike and canal owners, draymen, coachmen, and tavern keepers; and more recently the truck operators have had in turn to overcome the obstacles put in their way by railroad companies. But throughout our history the influence of those who favored change has outweighed the elements that favored maintaining the *status quo*.

Among the many ideas that have formed the philosophic or ideological background of Americans, two are of special interest through their relation to our economic development. These two lines of thought are found in our attitudes toward material prosperity and individualism. Most Americans have maintained little doubt that material progress is possible and desirable. This belief has its roots deep in our past. The original settlers were attracted to this country by the possibilities of improving

their social, political, or economic status. The abundant resources of their new physical environment gave the promise of unusual opportunities for economic advancement, and there was little in their religious or political thinking incompatible with the idea of material progress. Indeed, to labor hard at one's earthly calling was one of the tenets of the Puritan faith. A few generations later Benjamin Franklin's "Poor Richard" was pointing out to an appreciative audience the virtues of thrift and hard work as leading to the good and successful life. With variations, the theme has continued to occupy a leading place in our thinking. As one competent observer has noted, we have had "a people imbued with a passion for work and regarding 'business' not only as the absorbing concern of life, but as the social activity most worthy of emulation and reward."⁴ In the absence of a nobility or a strong military caste, the chief road to social distinction has been through economic success. With the possible exception of the *ante-bellum* planter aristocracy, there has been no stigma attached to being "in trade," as has been the case in other countries.

Economic progress has been considered the normal course of events in America. To be sure, doubts might be raised, especially during one of the many business depressions that have affected the economy, but these disturbing thoughts have given way to a reaffirmation of a faith that the future promises even more than has been realized in the past. The examples of the Astors, Vanderbilts, Carnegies, Rockefellers, and Fords, as well as of a large number of less well-known figures, have helped to perpetuate the Alger tradition that success in America was open to anyone who had the ability and the willingness to work hard. Not only could every American boy aspire to become President: even better, he might become a millionaire. Should he achieve the latter goal, he would enjoy the rewards of economic distinction; moreover, he could be sure that his comments on art, philosophy, or morals would command a wider and more appreciative audience than the observations on these matters by the most learned scientist or philosopher.

A belief in the importance of the individual was also evident early in our history. The doctrine drew its early inspiration from such sources as the pronouncements of the prophets of the Reformation; the experiences of the Colonists in drawing up their own "social compacts," and the writings of Roger Williams and John Locke. These ideas were in turn supplemented by the naturalistic philosophy of the French Physiocrats and the development of English liberalism in the late eighteenth and early nineteenth centuries.

The philosophy of individualism found an especially congenial environment in this country. The relative scarcity of people tended to raise the

⁴ See Edwin F. Gay's introduction to *Recent Economic Changes in the United States*, p. 7. New York: McGraw-Hill Book Company, 1929.

social and economic importance of individuals. Conditions in the New World put a premium on the qualities of self-reliance and personal aggressiveness. Very often it was not only economic success that depended on these qualities, but survival itself. Under frontier conditions, or even in more settled areas, social and economic problems were handled on a local basis by the joint action of individuals and with little reference to the central government.

Individualism led in the political sphere to an emphasis upon principles of democracy. In opposition to those who distrusted "the mob," Tom Paine and Thomas Jefferson in America added their contributions to the writings of Roger Williams in articulating the beliefs and aspirations of the majority of Americans concerning the dignity of human nature and the right of the common man to determine his own political institutions. This idea helps explain the American resentment against the English Parliament's refusal to allow the Colonists to govern themselves, which was one of the basic causes of the Revolution. It found expression in the prohibition of a noble class in the United States and in the ultimate extension of the privilege of voting in America until it has come to include universal adult suffrage. It has also been reflected in a distrust of centralized Governmental authority, either in hands of the Federal branch, as frequent emphasis upon states' rights shows, or in one part of the Governmental structure, as the system of checks and balances embodied in the Constitution illustrates.

In economic matters, the doctrine of individualism has been reflected in certain attitudes concerning the respective roles that should be assumed by the individual and the state in the operation of the economy. The idea, as it had evolved by the early nineteenth century, shows a close relation to the English principle of economic individualism, and may be summarized briefly as follows: The principal responsibility for economic activity, it was felt, should be in the hands of the individual, who, in the absence of interference by the Government, would exercise his talents to the best of his ability. In seeking his own best interests he would, to use Adam Smith's famous phrase, "be led by an invisible hand" to contribute to the good of the group as a whole. Economic competition between members of society would prevent the practice of any major abuses. Individuals, of course, could not be expected to put forth their full effort unless they were reasonably sure of receiving and keeping the results of their activity. It was, therefore, one of the principal functions of the Government to protect property rights. In addition, the Government might properly extend positive aids to farmers and businessmen in the form of subsidies, tariff protection, and the like. Otherwise, it should largely confine its attention to seeing that "the rules of the game" were enforced; but, other than in an exceptional case like the post office, the Government should not take any direct part in the economic process

itself. This idea was attractive to a people with a "continent to conquer." As Professor Parrington has explained, "In the presence of vast, unpreempted resources, the right of every man to preempt and exploit what he would was synonymous with individual liberty. Any government which should endeavor to limit such exploitation would be bitterly assailed; and if the small man were free to enjoy his petty privilege, the greater interests might preempt unchallenged."⁵

Economic individualism was largely unquestioned throughout the greater part of the nineteenth century. Laws were framed with the general purpose of putting as few obstacles as possible in the way of economic activity. The protection of property rights, provided by the Constitution, was strengthened from time to time by legislative enactment and by court decisions. Limitations on the exploitation of the public domain were gradually relaxed, culminating in 1862 in the free-land provision of the Homestead Act. Many of the state incorporation laws put almost no restrictions on the operation of business under the corporate form. Direct aid was given to railroad companies in the form of land grants and financial assistance.

Certain of these Governmental aids gave rise to protest. The Southern agriculturists, for example, objected to tariff protection for Northern manufacturers on the grounds that such protection jeopardized their foreign markets and raised the cost of fabricated goods at home. Eastern industrialists expressed a fear that cheap Western land would draw off their laboring force. But these complaints were less concerned with the principle of Government aid than with the specific forms that it should take.

As long as the economy was composed of farmers and small businessmen, the system of minimum Governmental controls apparently operated with reasonable success; competition among individuals and firms worked to keep prices within tolerable limits, prevented undue discrimination, and tended to reward people on a basis of their ability and energy. To be sure, our not infrequent business depressions were probably more severe than they would have been under stronger social controls, especially over the monetary and banking system. The "planless" exploitation of natural resources resulted in much unnecessary waste. But real agitation for stronger Governmental controls did not come until technical factors, along with a growing use of the business corporation, had resulted in large business and industrial units, which in turn might be combined into even larger organizations. "Big business," as represented by the railroads and industrialists, was increasingly under attack toward the end of the nineteenth century. Such legislation as the Interstate Commerce Act of 1887 and the Sherman Anti-Trust Act of 1890 were enacted

⁵ Vernon Louis Parrington, *The Colonial Mind, 1620-1800*, p. 273. New York: Harcourt, Brace & Company, 1927.

in response to public agitation for curbs on certain types of business practices. Theodore Roosevelt (and his "big stick") caught the popular fancy with his "trust-busting" activities and his colorful attacks against certain business leaders. Later Woodrow Wilson was able to get Congress to put through further "progressive" legislation calculated to give more effective control over the operation of the economy. But for the most part, the goal of the "reformers" was to restore the balance in the competitive system that had been disturbed by the rise of large business units. There was little agitation for the state to engage directly in economic production. Even the direct participation by the Government during the First World War was quickly abandoned in the "return to normalcy" of the 1920's. The decade ending in 1929 gave promise of achieving a new "era" in the drive toward material progress, which still had a great appeal to Americans.

The impact of the depression following 1929, however, brought renewed demands for centralized regulation over the economy. The "emergency" was the occasion for participation by the Government in economic activity on a fairly substantial scale. The continued failure of the economy to recover its expected vigor led to an extensive re-examination of our economic policies and institutions. The issues involved had not been resolved when the Second World War brought the state into all phases of our social and economic life on a scale unprecedented even in the previous world contest. It is for the future to determine the characteristics of our economic policies and institutions in the postwar period.

It seems reasonable to say that the basic faith of Americans in economic individualism remained fairly intact at least down to the beginning of the depression in 1929. To be sure, the previously held naïve trust in the effectiveness of unregulated competition to control production satisfactorily had been greatly modified, but plans for any "socialized" state had little support. Individuals or groups of individuals working under proper restrictions imposed by Government were still able to carry the principal responsibility for the operation of our economic system.

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CHAPTER 2

The Early Settlements: A European Investment of Capital and Labor

THE ECONOMIC HISTORY of America has its beginning in an investment of European capital and labor. The Colonial settlements were inspired by a wide variety of motives, but in a very large degree the accomplishment of the purposes of settlement, whatever their nature, depended upon the solution of a basic economic problem—to enlist the capital necessary for underwriting the venture and to recruit a labor supply possessed of the requisite endurance and skill. This necessity, in turn, called for some plan of settlement assuring an adequate return on the investment made. The adventurer, as the European promoter who risked chiefly a capital investment was commonly described, demanded a reasonable assurance that merchantable commodities could be produced in sufficient quantity to provide a profitable return of the capital sum invested. The Colonist who adventured his life and labor in the settlement naturally insisted upon a share in the produce of his efforts that would permit him either to return to the old country after a few years with his fortune made, or to remain in America in the enjoyment of an economic and social position superior to any he could command at home. It follows that the infant economy of an American community was measured chiefly by its capacity to meet the demands and potentialities of a European market. For only through the establishment of credit in an Old World market could the adventurer be assured of the return of his capital, the homeward-bound fortune hunter of the means for a fuller enjoyment of Old World life, and the permanent settler in America of an ability to purchase essential supplies in Europe. On the primitive frontiers of the New World, it must be understood, there was no hope of an advanced standard of living save through imports from abroad.

Such basic considerations, rooted in the very conditions of original settlement, were through many generations to shape the developing economy of America. Upon successive frontiers new communities were established, each representing an investment of capital and labor drawn from older communities, and each in its turn tied to a dependence upon established markets. The point of departure for most of the settlements here dealt with was London; but with the passage of time, such cities as Boston, New York, or Philadelphia were to assume a role in the westward advance of settlement not unlike that originally held by Britain's

metropolis. And while, with the passage of time, the growing complexity of the American scene compels attention to the many separate chapters into which the story breaks down, the over-all picture has been subject to only a gradual modification. Only lately has America's status in relation to Europe changed from that of a debtor to a creditor. Over large areas of the nation men have continued to count up their wealth in terms of the production of such primary staples as tobacco or cotton for a European market. The liberal rules of immigration that characterized our national policy until recent years trace their origins to the earliest attempts of Colonial promoters to meet the problem of an adequate labor supply in America. In brief, our dependence upon European capital, European immigration, and European markets outlasted our political dependence by many years.

Other features of the story are no less suggestive of a pattern familiar in our later history. The awakening interest in America that marked the dawn of modern Europe was first directed to exploration of the uncharted Atlantic. Next came establishment of footholds upon continental America, or on islands just off it, to serve, among other purposes, as outposts for a more careful study of the potentialities of the continent and its coastal waters. Such early projects of settlement as Raleigh's Roanoke Island venture and the first Colony at Jamestown were largely exploratory in character. Once the foothold was made secure, a task often of extraordinary difficulty, the early Colony served as a base from which explorers, traders, and farmers fanned out in an expanding field of endeavor. The original settlement, or a more fortunately situated base that took over its functions, was not unlike a bridge-head, its fortifications holding open a line of communication with the home base in Europe, from whence it received the tools and other equipment a young and undeveloped community must perforce obtain from abroad, as well as a yearly influx of immigrants offering their skill, their brawn, and on occasion a welcome contribution of capital.

Thus was the way prepared for an overland march destined to cross a continent. The explorer now traveled by land and inland waterway; a river bed or a mountain pass shaped his route instead of the wind and current at sea. But the work was essentially the same and the order of the advance unchanged. New outposts were established to hold open a line of communication with the coast and to aid in bringing up the supplies required for the next move forward. Well nigh three hundred years were needed for completion of the job, and at St. Louis and other such points men were to re-enact again and again in the nineteenth century scenes first associated with Jamestown, Boston, Philadelphia, or Charleston. In the story of American exploration and colonization, the break that terminated the so-called Colonial period in 1776 represents chiefly a change in the higher command.

A New World and New Opportunities

Europe's early interest in America presents a complex question. It is necessary, on the one hand, to understand that the New World offered aid to a solution of some of Europe's oldest problems. The western European states, whose leadership in trans-Atlantic adventure was a notable feature of the movement, were for climatic and other reasons dependent upon the East for supplies essential to an advancing standard of living. They produced only limited quantities of goods that were acceptable in exchange, and as a result it was necessary to make payments to the East in bullion that occasioned a drainage of specie, a circumstance that helps to explain Europe's eager hopes for American gold and silver. In America, too, there might be found fresh sources of supply, and an opportunity to provide additional commodities acceptable in eastern markets. On the other hand, it is even more important to recognize that the forces at work in this new age of discovery were dynamic, and that the energies of western Europe that now launched the most impressive era of expansion in human history had been long in the gathering. Those who study closely the processes in this modern movement of expansion will readily grasp the essential factors in the less dramatic growth that had prepared the way. Expansion, in a sense, had fed and was now to feed upon expansion.

Each new advance, in business technique as in geographical discovery, opened up new possibilities to challenge the ingenuity of men. Explorers in search of solutions for old problems not infrequently discovered instead hitherto unsuspected opportunities. America itself affords the classic example. Made known by a man who set forth in quest of a new route to the East Indies, it was to provide no satisfactory stepping stone to the Orient, as many at first hoped, but instead a distinctly new and major field of Europe's developing imperialism. Here the way lay open especially for the development of that phase of modern imperialism we know as colonization. The essential services of supply for New World colonies created in Old World centers fresh and expanding fields of business activity. The commodities the colonists sent back in return not only enriched the life of European communities, but increased the opportunities for exchange among themselves, facilitated their payments on new frontiers of trade in other parts of the world, and altered at points the very habits of life. Perhaps the most suggestive example is that provided by the modern tobacco industry. Built upon a weed unknown to the Europeans prior to the discovery of the New World and based on a habit borrowed from the social and ritualistic usages of the American Indian, it served to promote some of the most important experiments in colonization, quickly became a staple of worldwide trade, a means to the employment of increasing numbers of people in mercantile and industrial

establishments, and a bond of unity wherever men have occasion to exchange smokes. Of such things is the story of discovery and of Europe's expanding interest in America.

England and America

The economic origins of the United States, like its political traditions, trace back largely to a chronicle of English adventure.¹ It is appropriate at this point, therefore, to turn to England in search of a more exact estimate of the forces that shaped the settlement of America. Reliance upon private initiative and agencies was a distinguishing feature of English colonization. Nevertheless, men moved from the first in response to national needs, and through their efforts made England a party to the international contest that from the sixteenth through the eighteenth centuries marked the economic and political history of America. In the promotional efforts attending early overseas adventure nothing is more impressive than the constant changes rung on the theme of national interest. Many a man contributing to the support of experimental ventures overrode his business judgment, in the desire to render a patriotic service. In this very service to the commonweal, however, lay an opportunity that appealed to the hard business sense of men. A successful venture strengthening the national position offered the surest promise of ultimate profit; and this assurance was reinforced by the very policies of the state. Private investment was often encouraged by the granting of royal charters guaranteeing a monopoly of the benefits accruing and offering, implicitly at least, such other aids as a tariff preference in the home market over all foreign competitors.

This union of individual and national interests arose from certain practical considerations of which was born an ideal of national self-sufficiency. England's commercial prosperity, and hence in large degree her domestic economy, depended upon the marketing of her great staple, woolen cloth.² In the latter half of the sixteenth century her established markets were beset with many uncertainties. The trouble arose in part because of increasing production of woollens on the continent, competition that could be met only through improved techniques of processing and dyeing. Another source of concern was the international tension, fed partly by the conflict between Protestantism and Catholicism, that repeatedly threatened or brought wartime disturbances of trade. These risks also beset England's imports of sugar, silk, wine, and other com-

¹ For the earlier chapters in this chronicle, outstanding studies are those of J. A. Williamson: *Maritime Enterprise* (Oxford: Clarendon Press, 1913); *Sir John Hawkins* (Oxford: Clarendon Press, 1927); and *The Age of Drake* (London: A. & C. Black, 1938).

² An especially valuable discussion of the relationship of the cloth trade to English expansion is Sir William Foster, *England's Quest of Eastern Trade*. London: A. & C. Black, 1933.

modities increasingly essential to a rising standard of living. Significant was England's dependence upon Spain as a major market and a hardly less important source of dye materials and vegetable oils required for the processing of cloth. Under Elizabeth England had emerged as the foremost Protestant power, while Spain under Philip II became the leading Catholic champion. Their relations were marked by a growing tension that broke in war with the sailing of the Spanish Armada of 1588. As war approached many Englishmen felt an increasing concern over the extent of their dependence upon the nation's arch-foe. National security clearly required the opening of new markets and the assurance of alternative sources of supply for essential materials not produced at home.

Overseas adventure offered an obvious solution, and such a plan of action was encouraged by a common disposition to attribute much of Spain's threatening power to her extensive possessions in America. Of the several proposals advanced chief interest for us is found in those that directed attention to the possibilities of North America.³ The way there from England was relatively short and, provided key positions were promptly fortified, promised to be free from foreign interference. The hope for a market was twofold. In the first place, a passage through or around North America might lead to Cathay (northern China), where by reason of the country's climate and reputed wealth a profitable sale of woollens could be expected. Moreover, the North American climate itself was favorable and the native inhabitants, through a judicious mixture of missionary and business enterprise, might learn to value English clothing—a hope that was not altogether misplaced. The Indian, it is true, proved slow to adopt English habits of dress, but an exchange of woollen blankets for furs and skins became so important throughout the colonies that the modern American has difficulty in dissociating the Indian and the blanket. As the history of this great trade indicates, and as contemporary students on the basis of observations made at Roanoke Island and other points estimated, the market was potential rather than real and depended upon some form of English settlement in America. The primitive state of the Indian's economy dictated a similar conclusion regarding the exploitation of natural resources; while the results of exploration by men like Frobisher, Gilbert, and Davis argued that whatever passage might exist, its discovery would require a closer search that might be better undertaken from some established base in America itself. Opinion, in fact, increasingly favored the hope of discovering a river on the Atlantic side of the continent that could be joined by means of a short overland portage

³ An unusually valuable collection of source materials is found in E. G. R. Taylor, *Writings and Correspondence of the Two Richard Hakluyts*, Vols. I and II. London: Hakluyt Society, 1935.

to some other waterway having its outlet in the Pacific.⁴ And this called, of course, for the kind of exploration, much of it overland, to which the Virginia Colonists were repeatedly to direct their attention in the hope of reaching the "South Seas." At the same time, Spain's sugar, tobacco, cattle, and ginger-producing plantations in the West Indies, together with Portugal's success with transplanted woad⁵ in the Azores and wine in Madeira, had suggested an agricultural type of settlement for the supply of essential materials that England was forced to import.

And so did basic geographical and ethnological considerations, together with the full range of England's needs, suggest that her hopes of the New World could be realized only through military and political occupation of the American continent, at any rate to the extent necessary for its control and the exploitation of its diverse opportunities. In the opinion of the two Richard Hakluyts, relatives and close consultants of Raleigh in his Roanoke Island ventures, such an occupation might with time make of North America a center of well-rounded agricultural, pastoral, industrial, and commercial activity, reinforcing England's economic independence and affording settlers every opportunity through a true exchange of goods to profit by England's peculiar needs.⁶ Their plan set the following objectives, some immediate, others to be realized over a long term: (1) establishment of outposts for exploration and experimentation, a necessary preliminary to all other effort; (2) exploitation of fisheries and of natural dyes, medicinal herbs, mineral deposits, naval stores, and other readily collected products, especially as a means of meeting immediate and unavoidably heavy overhead costs; (3) location and development of the plantation type of settlements producing sugar, wine, silk, hides, olive oil, dyes, and other such staples; (4) further development of such extractive industries as the resources of America and the requirements of England dictated—shipbuilding and the repeated attempts at iron manufacture, for example; and (5) development of a native market, to be achieved first through a sale of beads and inexpensive trinkets that might well be manufactured in the Colony itself, and to be joined ultimately to the cloth trade through the civilizing influence of English settlement. It was not expected that all these opportunities were to be centered in any one place. Plans took account of the entire coastal region extending northward from Spain's defensive outpost in Florida, and envisioned a series of settlements effectively joined through control of the intervening navigation.

⁴ The hope came partly from a knowledge of the riverways of Russia, where English agents of the Muscovy Company had passed from the White Sea by way of the Dwina to within reach of the Volga, and then by it to the Caspian Sea and so to Persia.

⁵ A plant serving as a major source of blue dye, a favorite color then as now.

⁶ On the highly significant work of the Hakluyts, see G. B. Parks, *Richard Hakluyt and the English Voyages* (New York: American Geographical Society, 1928), and again E. G. R. Taylor's collection of their writings.

Problems of Finance and Organization

The program outlined by the Hakluyts was obviously a long-term one requiring heavy investment. Only the great merchants of England possessed the capital, experience, and equipment essential in so hazardous an undertaking. But the wealthier merchants, preferring instead the promise of a more immediate advantage through new trades with Russia, the Levant, and in time with the East Indies by way of the Cape of Good Hope, were slow to respond. No small part of the explanation for the unhappy results of initial attempts in America is found in this reluctance. As the latest student of Gilbert's ventures has emphasized, the most significant of Sir Humphrey's failures marked his attempt to secure the backing of a first-rate mercantile community.⁷ He won, it is true, limited help from the second-rate outport of Southampton, but the great merchants of London, who alone, with the possible exception of Bristol merchants, had the necessary means, remained indifferent. And though little exact information exists regarding the financing of Raleigh's subsequent projects, it appears that he was little if any more successful.

There were early projects of American adventure, of course, that did enlist the support of mercantile interests. Examples of these are found in the great fishing fleets annually sent out from the western ports of England to exploit the rich fisheries of North America, in frequent expeditions for the plunder of Spanish trade and possessions, and in occasional voyages of discovery or other such speculative adventures. But the initiative and leadership in projects that were designed to effect a permanent occupation of the continent came largely from the landed classes. Indeed, as the names of outstanding figures from Gilbert and Raleigh to William Penn repeatedly testify, the leadership of this group remained a highly significant feature of the movement. The explanation is not difficult to find. A complex transition through which English society was passing produced pressures that bore with especial acuteness on all who lived by the land, and turned their thoughts increasingly to the well-nigh limitless expanse of fertile soil in America. Hard-pressed tenants and farm laborers glimpsed a vision of independence through the acquirement of their own land in the new world, while the landed aristocracy saw an opportunity to meet a rising standard of living through an extension of its feudal forms of proprietorship to America. It was to this latter interest that Gilbert most successfully appealed for support of those projects of 1582-1583 that are generally accepted as marking the genesis of American settlement. The agreements he entered into with several gentlemen, agreements embracing millions of acres and plans

⁷ D. B. Quinn, *Voyages and Colonising Enterprises of Sir Humphrey Gilbert*, Vol. I, pp. 1-104 (2 vols. London: Hakluyt Society, 1940), provides the best study of Gilbert's ventures. Among the documents included are important promotional tracts.

for a feudal type of jurisdiction, stamped the American venture at its very outset with the qualities of a gigantic speculation in land. And so it was long to remain, its principal impetus the hope of men to gain possession of some part of the land.

The land in itself, however, was of little practical use unless it could be joined through established channels of trade to the markets of Europe. Those who settle on the land must first give thought to ways and means of reaching a market, a necessity that is apparent in the tendency of settlement in America to cling to riverways affording ready access to markets as late as the very eve of the railway construction which in the nineteenth century "opened" new lands. Theoretically, it would have been possible to finance a purely agricultural experiment in America over the long term that would be required to prove the soil and produce marketable commodities in sufficient quantity to justify the regular dispatch of shipping from Europe. Actually, the resources available were altogether too limited, and in any case it seemed better business to rely upon other and more varied hopes. If settlement of the land could be combined with a prosperous trading venture, the farmer could feed the trader, acquiring a share in the return of his goods to the European market and enjoying meanwhile favorable freightage as a means of testing agricultural experiments that might themselves with time support a flourishing trade. Such was the reasoning that guided the earliest projectors of American settlement. Although trading and exploratory ventures were often sent to America independently of colonizing efforts, it is significant that early projects of settlement usually embraced the hope of finding a passage to Cathay, gave emphasis to other prospects for trade, and counted upon some tie-up with the fishing industry. In its simplest form, the hope was that the farmer might share in the returns from fish; in its grandest conception, men saw, with the discovery of a passage, unlimited opportunities for profitable settlement along a main artery of England's Oriental trade. So great was the need, and so emphatic the effort in promotional literature, to convince the great merchants of this full promise of America that modern students are easily misled as to the essential nature of a movement that was no more concerned with trade than with colonization except insofar as the one may have appeared to be on occasion an indispensable step toward achievement of the other.

A Joint-Stock Experiment in Virginia

It was not until after the Anglo-Spanish war, which to its end in 1604 naturally directed attention to projects offering more immediate aid, that the great merchants became seriously interested. In 1606 the first Virginia Charter was issued in behalf of two groups of gentlemen and merchants, one representative of interests centering around the western

port of Plymouth, the other with headquarters in London and including among its leaders Sir Thomas Smith, governor of the recently established East India Company and the greatest merchant prince of his day. The charter authorized exploratory, trading, and colonizing activity along the American coast from Carolina to Maine, with the northern region assigned to Plymouth, and the southern to London—a division indicative of the influence of prospects for sugar, silk, wine, and other staples indigenous to southern climates in gaining the support of the London merchants. Two settlements were promptly undertaken in 1607, one at Sagadahoc in modern Maine, the other at Jamestown. The former was soon abandoned, but the latter lived on to become the first permanent English settlement.⁸

The difference is largely explained by the fact that the Jamestown experiment had behind it the resources of London. The initial effort in Virginia is properly regarded as an exploratory field expedition that actually achieved much of what it was intended to accomplish. Hopes of a passage, an occasional thought for gold, and a much stronger interest in rich copper mines reported by Raleigh's agents on their return home in 1586, all came to nought. But iron was discovered, valuable experience in dealing with the natives was gained, and exploration revealed a rich and fertile region traversed by the most marvelous system of inland waterways to be found on the Atlantic Coast. Here, indeed, was a promise for settlement and trade broad enough to stir men to great endeavor. It came in 1609. The London adventurers were reorganized and their membership enlarged under a second Virginia Charter. This and a third charter in 1612 created the usual organization of an English commercial company. Powers vested in a governor, council, and general assembly or court of the adventurers provided an administrative pattern for the government of the Colony that has left its mark on the structure of American state government even to the present day. The joint-stock device, whereby the contributions of many individuals were pooled as one large fund for investment under the direction of the company's officers, was used to provide one of the most impressive sums ever invested in any English maritime venture. Not only was the wealth of London enlisted, but heavy drafts had been made on its tested business experience for the organization and management of the enterprise.⁹

The Virginia Company, however, was no ordinary commercial corporation. The landed gentry were largely and influentially represented

⁸ The leading authority on economic as well as other phases of early American settlement is C. M. Andrews, *The Colonial Period of American History* (4 vols.). New Haven: Yale University Press, 1934-1938.

⁹ Comprehensive in scope is W. R. Scott's *English, Scottish and Irish Joint-Stock Companies to 1720* (2 vols.). Cambridge: The University Press, 1910-1912.

in its membership, and like many other land-grant companies that were to follow it in American history, its purpose was colonization. More than 500 settlers immediately set sail for Virginia, and plans were laid for another thousand promptly to follow. Hope for an agricultural experiment with staples like wine, sugar, tobacco, and silk was especially strong, and as the history of a sister colony planted in Bermuda by the Virginia adventurers after 1612 clearly indicates, this hope tended increasingly to overshadow all others.¹⁰ The plan of settlement was adjusted to the peculiar requirements of a task largely exploratory, experimental, and otherwise preparatory. In tackling the problems of frontier settlement, Americans thereafter were frequently to have occasion to resort to community enterprise, as in clearing new ground or in raising a house, and so went the decision now. It was agreed that for a seven-year term all would work together in a communal effort, with men assigned to such tasks as circumstances or special aptitude might suggest. At the end of the term the common rewards of their labors were to be proportionately divided. Through an interesting adaptation of the joint-stock principle adventurers and planters were at the same time joined in a similar community of interest.

The joint-stock of 1609 was no mere capital fund, but rather a pooling of both capital and labor. The colonists were recruited under an agreement with the adventurers (its form undoubtedly influenced by the share-right practices under which crews were at times recruited for fishing, piratical, and trading voyages) to divide on a share-and-share-alike basis all returns from the joint investment. The personal adventure of the colonist was rated as equivalent to £12 10s., the value of one share of stock, with provision for a higher rating being made for those bearing a special responsibility or offering a specialized skill. Separate contracts for wages, charged against the joint-stock before division, were possible for those who did not care to go on adventure, as it was termed. That most of the colonists went on adventure, however, there can be little doubt. And there is no difficulty in reconstructing the hopes they followed. At the end of the specified term in 1616 large areas of the land would, with good fortune, have been cleared and made secure; the soil would have been tested and marketable crops proved; essential explorations completed; extractive industries tried and some established; and a profitable trade with the natives organized. Then would come, as promised, a division of both the land and the capital returns accumulated to the credit of the joint-stock, with dividends assigned to each adventurer and colonist according to his shares. Possessed thus of an

¹⁰ For discussion of the many experiments of the Virginia adventurers, see W. F. Craven, *Dissolution of the Virginia Company* (New York: Oxford University Press, 1932); and *Introduction to the History of Bermuda* (reprinted from *William and Mary Quarterly*, Vols. XVII-XVIII, 1937-1938).

individual title to the land, the colonist would take his share of cattle from a common herd that had been shepherded together for a seven years' natural increase to offset the high cost of their shipment from England, put his land to such crops as had been proved under expert guidance, and draw upon his monetary dividend for the purchase of essential equipment. The company, still possessed of countless acres of undivided land for further colonization, might press such trades as circumstances directed, relying upon periodical joint-stock subscriptions for the purpose, and in the regular supply of the colony could look forward to an expanding business opportunity.

The results, it hardly needs saying, were extremely disappointing. So much ill fortune beset the company that by 1616 its resources were exhausted, and disillusionment threatened the very existence of the colony. Yet, as men soon recognized, the effort had actually met with a modest success. Some of the land had been won, and though other experiments had failed those with tobacco now gave assurance of at least one marketable staple that had the advantage of maturing for the market within one season. There was in this success alone enough to stir anew the hopes of men, and the promise that beckoned again was made more attractive by the chance that where one valued staple had taken root others might still be proved. By 1618 the great migration, as historians have described it, was under way—a migration that was to carry thousands into Virginia where before only hundreds had gone; that was to spread out over the British West Indies, and in its mounting force to effect the occupation of Maryland and New England.¹¹ From this point on few factors in our story bear greater import than a growing willingness of Englishmen to migrate to America. Their readiness to settle in a new land points not only to the familiar economic, religious, and political causes of unrest, but to the increasing promise of America itself. The Virginia Company, earliest beneficiary of this folk movement, never really recovered from the heavy weight of debt incurred in its first experiments. After a final attempt to prove at one stroke the Hakluyt program of diversified settlement, it went down in bankruptcy in 1624, and Virginia passed under the direct supervision of the crown as the first royal Colony.

Though a failure by business standards, the Virginia Company had nevertheless rendered a great service. In 1606 Englishmen knew the Chesapeake only by report and probably not even that much of such neighboring regions as Delaware Bay; they had yet to test the alternative sailing routes across the Atlantic with reference to the actual problems of transporting men, women, children, livestock, seeds, and plants; and depended chiefly upon the limited experience of Raleigh's people at

¹¹ A useful summary of the full story is found in A. P. Newton, "The Great Migration, 1618-1648," *Cambridge History of the British Empire*, Vol. I, 136-182.

Roanoke Island to guide them in their relations with the native Indians. To such preliminary and financially unprofitable tasks the Virginia Company had directed its energies, and all men who subsequently settled in America stood in its debt.

Land Policies and Immigration

The policies of the company's later years gave shape and form to the further development of the American experiment. Of chief importance after 1616 were those policies governing the distribution of its land. In accordance with an obligation under previous contracts to issue land dividends, and prompted by a lack of other assets, the company awarded a dividend of 100 acres per share to all those holding full rights in the joint-stock. A comparable grant was also offered to any who would now invest £12 10s., a move that virtually reduced the company to a real estate corporation dealing in undeveloped lands. In another move to provide revenue an annual quitrent of 2s. per 100 acres was reserved by an act that marks the beginning of a quitrent system continued by the Crown, and borrowed by other American proprietors as a source of revenue incidental to their overlordship of the land. To encourage a development of the land, the company promised an additional grant of 50 acres for every person settled in the colony. Thus might a man who had received an original grant of 100 acres double it by sending or bringing into the colony two men for its cultivation; or, to use another example, a man able to finance his own migration with a wife and three children might move his family to Virginia with the ultimate assurance of acquiring 250 acres of his own land. This was the famous headright system under which a man's claim to the land was figured in proportion to the number of laborers he provided for its development. The essential administrative principle involved, it will be seen, was a use of land reserves to underwrite immigration. And though Virginia's headright system was not exactly reproduced in all colonies, the principle in some form or other underlay the economic development of each and all.

By such policies increasing numbers of Englishmen of modest means and position were induced to settle in America. Selling or mortgaging their property at home, and on occasion drawing upon the generosity of relatives, they brought to the settlements both capital and labor, not to mention a very helpful contribution to the tone and quality of Colonial society. There is no way of estimating accurately their numbers, but in all colonies they constituted an important segment of the population. These same policies opened up opportunities as well for those who had only their labor to offer. Thus was shape given at an early date to a system of indentured labor that was especially important to the Middle and Southern Colonies, and that survived even the growing competition of Negro slavery, itself encouraged at points by the master's privilege

of claiming a headright for every African imported. The indentured servant, or redemptioner, as he was at times identified, migrated under a contract, written or merely understood, to work out the cost of his passage by several years' labor in the colony. The contract was usually with a shipmaster sailing for America, or with someone for whom he acted as agent, and it was understood that it would be sold on arrival. The farmer, or local merchants who found it profitable to deal in such labor contracts, paid in produce, and the exchange quickly developed into a main feature of the commercial transactions between England and America. The recruiting of servants at home became a large-scale business in itself, with agents extending their activity far inland from the seaport towns in which it first centered.¹² Indeed, an export of labor through this and other devices, including the contract labor scheme of the nineteenth-century industrialist, was long to remain the principal item in Europe's supply of the American market.

Though this early trade was obviously open to abuse, that part of the story may easily be overemphasized. Public authority on both sides of the Atlantic moved to regulate its operation. The institution borrowed heavily from the law and custom of English apprenticeship, and was used to provide the colonists with schoolmasters and other professional aids as well as farm hands. In fact, it is properly viewed as offering to thousands of young people whose outlook at home was limited by economic and social conditions an opportunity to serve an apprenticeship in American undertakings that might lead, and more often than not did lead, to a better life.

As the role of the recruiting agent forcefully indicates, the function of the promoter in the later period of settlement was no less important than in its earliest stages. Of especial value was his continued contribution to the opening of new areas of settlement; and even immigrants to older centers often required the assurance of participation in some organized group action to overcome their natural reluctance to take the hazard. The land policies of the Virginia Company, accordingly, had been framed principally with a view to the encouragement of co-operative efforts, and were closely joined to a scheme of settlement in well-knit town communities that would provide among other attractions the inestimable advantages of comradeship and company. To these considerations were added other problems. It was commonly recognized that much agricultural experimentation remained to be done, since few Englishmen, despite their ambition to extend their landed estates into America, were willing to hazard large sums on the possible returns from tobacco alone. To share the cost and spread the risk of this experimental work appeared now as before a reasonable procedure. And since

¹² See an interesting article on the subject by A. E. Smith in the *Journal of Economic History*, Vol. II (May, 1942), pp. 40-53.

men were willing to risk only a modest individual investment, a question of how best to provide supervision of overseas labor arose as a serious administrative problem. It is not astonishing, therefore, that many of the first English proprietors of land in America sought its development through co-operative associations.

Joint-Stock Associations on a Smaller Scale

The Virginia adventurers after 1616, drawing heavily on their experience in Bermuda, pooled their land claims against the company to secure a common patent in evidence of title to one large acreage. For the development of such plantations, or "hundreds," as they were at times called, the joint proprietors subscribed to a common fund, met as occasion required in courts and committees, negotiated through designated officers with shipowners and prospective settlers, and drafted plans for a communal type of effort to be executed under the direction of such overseers, captains, or governors as might be designated for the command in America. These subsidiary agencies of colonization, in other words, represented reasonably faithful reproductions of the parent company. Each group was in large measure autonomous, and plans might thus vary, but fragmentary records indicate that the communal effort was to continue only for such a term, apparently seven years, as was required to accomplish those tasks of original settlement that had dictated the earlier community scheme of 1609. Trading truck sent out to Berkeley Hundred in Virginia shows a purpose to rely upon the financial aid of trade in meeting heavy costs of settlement. There is evidence, too, that contracts with settlers were often made on terms of adventure that included a share in the land upon its later division. In other instances, a system of half-share tenancy, an adaptation of the original share-and-share-alike principle, was borrowed from the custom of Bermuda and the usage of the company in Virginia in the development of plantations of its own for the benefit of the joint-stock and for the support of public charges. In either case, servants might be sent on simple terms of indenture without reference to the share rights of other and more responsible settlers except insofar as the cost might become a common charge. The adventurers were free, of course, to divide the land as they saw fit, and it should be noted that under rules of the company the plantation would be by the very act of its occupation doubled in acreage. It would be increased, too, by the increment of headright claims for all persons settled thereon. The major effort of the Virginia adventurers after 1616 was thus broken down into a number of smaller projects patterned essentially after the original scheme of 1609.

Historically, the most interesting of these projects was that which brought the Pilgrim Fathers to America.¹³ Having in 1608 found refuge

¹³ The best discussion is Andrews, *Colonial Period*, Vol. I, pp. 249-299.

in Holland from religious persecution at home, they became interested by 1617 in emigrating to America, and entered into negotiations with the Virginia Company. Because they had little to offer except their labor, they made a contract with a group of adventurers who held a patent from the company. The agreement reproduced all essential features of the 1609 joint-stock. The unit of investment for the adventurers was £10, and the personal adventure of the settler was rated at an equal figure. As was customary, the settler might invest in additional shares of the stock. A community of property, funds, and effort was to hold for a seven-year term. For reasons not too clear, the Pilgrims landed in New England instead of Virginia, but few other changes in plans resulted immediately. A patent obtained in 1621 from the newly established New England Council reproduced even the phraseology of the usual form of Virginia patent, and left unchanged the existing arrangement between adventurers and Colonists. The experiment proved disappointing, however, especially to the adventurers. Accordingly, through negotiations of 1625-1626 the Pilgrims undertook to buy out the claims of their partners, and subsequently organized the trade of the Colony to provide funds for the purpose. Their ultimate success is a further reminder of the relationship of trade to colonization.

The Virginia plantations present a different story. Experiencing all the misfortunes, including epidemic sickness and Indian massacre, that beset the colony, they went down in the general bankruptcy of 1624. Their liquidation left little to bother the Colonists who survived to carry on their individual efforts, not even an absentee title to the land. Yet, brief as was their existence, they hold for the student more than passing interest. They were succeeded by somewhat similar joint-stock projects of adventure in American settlement; some of their instruments, like share-crop tenancy, took root in the plantation economy of America; and their history lends special emphasis to those basic problems of settlement that were so often to invite some form of community effort. Striking parallels in the early history of the Dutch patroonships in New York, private projects of settlement and trade backed by adventurers in and under patents from the Dutch West India Company, suggest that this phase of the Virginia experiment was shaped principally by the conditions governing the early settlement of America rather than ideas peculiar to the London adventurers.

The Proprietary Pattern of Settlement

The later history of the patroonship shows an even closer relationship to the vast landed proprietorships that after the 1620's became a highly significant feature of English settlement.¹⁴ As early as the time of

¹⁴ Especially useful is Andrews' introductory discussion of the proprietries, *Colonial Period*, Vol. II, pp. 199-240.

Gilbert's ventures gentlemen of the landed classes had been eager to acquire extensive grants with a view to their development under a feudal type of landlordism. The practical problems of getting people onto the land and into a position to produce rents had, however, forced a postponement of these hopes. A leading factor in their revival was the increasing number of Englishmen willing to venture both their lives and fortunes in America. Here, in brief, was an opportunity for a gentleman of wealth and position to assume the role of promoter, and to direct some part of a growing body of emigrants to his own lands under a feudal scheme of settlement. His social and political position gave him a decided advantage in securing a title to the land, and there was nothing anomalous to the contemporary Englishman in proposals for a feudal type of settlement. Its forms of land tenure were the familiar ones. The lord proprietor's claim to jurisdiction over his tenants was no less familiar, and in practical terms meant an assumption by him of a primary responsibility for the establishment of law and public authority, absolute prerequisites to orderly settlement. Nor should it be forgotten that most Englishmen were by habit and experience more disposed to place their confidence in a gentleman than in any other leader.

The story has its beginning in the New England Council. This association of gentlemen secured in 1620 a charter to the New England area. Much in the organization and activity of the body reminds us of the forms of joint proprietorship then being tried in Virginia, but even more forcefully does the record look forward to the later phases of proprietary settlement. The council's ideas of colonial administration were feudal in character, and its most significant activity through a decade marked chiefly by the failure of its plans was the issuance of land patents. Some of these, notably the Mason and Gorges grant to New Hampshire and Maine, remained important to New England's history for several decades beyond the brief life of the council itself.

More pertinent to the discussion is Lord Baltimore's grant to Maryland. The recipient in 1632 of a royal charter granting 10,000,000 to 12,000,000 acres on upper Chesapeake Bay, he established his first settlers at St. Mary's in 1634. These and others who followed were recruited through a well-conceived promotional campaign that offered individual land grants in proportion to the investment to be made. This investment was measured by the number of persons equipped and settled by the grantee on the land. That the larger grantees, their acreages designated as manors, might be created manor lords with many of the traditional prerogatives and responsibilities of that dignity at home, should not becloud the far more significant point that Lord Baltimore's land policy was essentially little different from that in Virginia. He sought to use the land, a form of headright serving as an equitable unit of apportionment, to underwrite a settlement which would in turn enhance

the over-all value of his holding. From quitrents, licensing fees for trading privileges, and other prerogatives incidental to his lordship of the land, together with the direct returns from certain proprietary manors cultivated by his own immediate tenants and servants, he hoped to recoup, with a benefit extending down through successive generations of his family, a very considerable investment made in the promotion of the Colony.

The same general hope inspired his equally famous successors—the Carolina proprietors in 1663; the Duke of York, proprietary lord of New York on its conquest in 1664; Lord John Berkeley and Sir George Carteret, joint proprietors of Jersey by grant from York; and after 1681 William Penn in Pennsylvania. It is unnecessary to recount here the history of each proprietary colony. The objective is not to relate the full chronicle of settlement, but rather is concerned with a developing pattern of settlement that reveals the nature of those interests that inspired its promotion and the technical arrangements through which men sought the accomplishment of their several purposes in America. The list is in itself a sufficient indication of the extent to which a proprietary type of management dominated the later phases of the movement. Such additional grants as are represented by the Fairfax estate, which did not include the usual powers of government but covered a very large portion of the modern state of Virginia, emphasize the point even more strongly.

All of the great proprietors looked upon their extensive grants as private estates from which they expected not merely a revenue for public administration, but a personal income commensurate with the lord proprietor's position and responsibilities as well. They were no more indifferent than earlier promoters to opportunities for trade; but their principal asset was obviously a prior title to the land and their chief prospect of profit was in turning this asset to advantage through the promotion of settlement. All in some measure adopted feudal ideas of settlement, though none clung so stubbornly to an exact pattern of this sort as did the lords Baltimore. Feudalism, in fact, put out few roots in America, and such of its vestiges as survived proved to be more of legal than of economic significance. Proprietors were usually ready to turn the land to account as the occasion offered, and to deed it away on several terms of grant, lease, and even sale. Quitrents were usually, though not always, reserved. Sections of the land were often set aside as a proprietary reserve to be held for future use or disposal when development of surrounding areas had brought an increase in its value. The essential interest, in short, was a land-office business, and much of it was of a speculative nature.

One of the promotional devices was to enlist the aid of subsidiary promoters, who assumed a role in the development of a single province

not unlike that played by the greater proprietors in the larger field of English settlement. Generous grants to individual settlers made in anticipation of, and as an inducement to, a subsequent development, served, too, the useful political purpose of allying the more energetic and wealthy members of the community with the proprietary interest. One of the better examples is found in the manorial grants made in New York that had the ultimate effect of incorporating leading Dutch families in a landed aristocracy of great importance to the social, economic, and political life of the Colony. Some of these grants merely confirmed, as with the vast patroonship of the Van Rensselaer family, titles tracing originally from grants by the Dutch West India Company. Such proprietary assignments followed a policy essentially no different from that of the home government in England, which offered extensive grants to individuals or corporate groups as an inducement to undertake their development. The same practice was often followed in other Colonies besides the proprietary ones, frequently at the instance of a colonial legislature, for the promotion of frontier settlement. That many grantees took their promotional duties none too seriously, and used them merely as an excuse for speculative ventures, illustrates how prodigal men can be with the land where there is so much land. The widespread influence of these practices forces upon us the conclusion, too, that for the average settler there could not have been as much "free land" as popular tradition would have us believe.

When, after the line of settlement had finally reached the Appalachians, men looked across them upon the fertile region of the Ohio, they followed but the established customs of American settlement in seeking extensive grants as individual adventurers or for the several Ohio and Mississippi companies that vied with one another in a bewildering confusion through the era of the American Revolution. Nor did this race for awards of lands by any means mark the end of the land-grant system. Whatever significance others may attach to the great land grants with which railway construction and colonization in the West were subsidized in the nineteenth century, they speak to the student of colonial history primarily of a very old and a very American way of getting on with the country's development.

Corporate Settlements in New England

No less important to later chapters of our history is the Puritan settlement of New England. The Pilgrim community at Plymouth was but one of several projects undertaken in the 1620's under patents from the New England Council. The more significant of them focus attention once more on the relation contemporaries saw between the fishing industry and possibilities for settlement. The waters of the North Atlantic had early attracted the fishermen of Europe. And though some of

them on occasion remained in America for a winter or more, thus contributing in advance of organized colonization to a growing European population of fishermen and traders, they normally came out and returned with the fishing fleets each year. Some observers felt that it would be more economical to settle the fishermen in America and center their activities here except for the final marketing. With this proposal was tied up the hope of building a colony upon the diverse opportunities for profit in supplying and equipping the fishing fleets. It was expected that salted codfish would thus serve the Colony as an exportable staple guaranteeing, like the tobacco of Virginia or the wool of later Australia, an essential supply of European goods.

The full co-operation of the fishing interests would have given such a project more than adequate financial backing. But the great fishing interests, like the great fur-trading and cattle-raising interests of another day, tended to oppose rather than favor colonization. Not only were its leaders disinclined to undertake the expensive work of settlement such a transfer would have involved, but the fishing ports of western England which annually profited by outfitting the fleets and marketing their catch naturally could see in the idea no advantage for them. Moreover, they viewed with apprehension any move to establish an authority in America that might impose restrictions or exactions of a sort already suggested by plans of the New England Council on essential privileges of the shore for drying, salting, and repairing operations. It is to be noted that in Newfoundland, where these interests were able to maintain control, a normal development of the colony was retarded until well into the nineteenth century. As a result of this attitude early colonizing efforts in New England were small in scale. The most important of them, representing a joint-stock association of Dorchester, moved by way of several disappointments to the establishment of the famous old town of Salem in 1626, but its people were a mere handful and the future of New England's settlement still appeared to lie along a way of slow and painful progress like that of the struggling Pilgrims at Plymouth.¹⁵ But just at this point the spiritual force of Puritanism endowed the New England experiment with resources and energies unmatched in the story of English colonization.

The Puritans, increasingly perturbed over the trend of ecclesiastical policy at home and alarmed over the future of a parliamentary cause with which their security as a religious minority was closely united, made plans in 1628 for a settlement in America. Economic disadvantages sharpened the discontent of a religious group, and the search for a solution to the problem was greatly influenced by the wide experience

¹⁵ Especially valuable is Frances Rose-Troup, *The Massachusetts Bay Company and Its Predecessors*. New York: The Grafton Press, 1930.

of prominent Puritans in the commercial life of the nation. Puritanism was strong among the middle classes of England's commercial centers, and over the eastern counties that depended heavily upon a woolen industry still faced with difficulties. As the writings of John Winthrop and other sources indicate, the continuing problems of landowners in England helped to win the support of gentlemen of means, background, and experience in public affairs. There can be no question, however, that the inspiration of the movement was essentially religious, and its primary purpose to establish in America the true church as the Puritan understood it. His thought was not merely of his own salvation, but of a purpose to found in the New World wilderness a City of God that might ultimately by its demonstration of the true way serve even to redeem England from a false leadership. The Colony thus represents the earliest of many projects of settlement, great and small, extending through the Quakers of Pennsylvania to the Mormons of Utah, in which a religious purpose gave strength and shape to an economic effort no less than to a political and social order.

It is this religious purpose that explains the unusual advantages of leadership enjoyed by the Puritan Colonies.¹⁶ Though it has become a popular fallacy to regard them as impractical "Biblical commonwealths," the plain fact is that no other Colonies in the first years of settlement equaled them in the background, education, and hard-headed experience of their leaders. The appeal of a great religious undertaking attracted, too, an unusually large number of men of substantial means. As the flow of migration to New England increased—a migration estimated at no less than 20,000 persons in the years before the outbreak of the English civil wars in 1642 brought a revival of Puritan hopes at home—there passed each year through Boston more than the normal complement of men having, in addition to a will to settle, the capital reserves to serve the purpose. The economic life of New England for a time fed principally upon an annually renewed investment of capital and labor. Just as the settlement of Maryland extended the range of economic opportunity for the neighboring Colonists of Virginia, so did the unbroken stream of immigration into New England provide an expanding market for agricultural produce and the output of such other activity as there had been time to organize for the supply of newly arriving Colonists. Indeed, no other chapter of our story reveals so clearly the importance to the accomplishment of the original purposes of settlement of a continuing investment of capital and labor. A lag in this essential provision, occasioned by disappointment and doubt following promptly upon an original enthusiasm, often meant the difference between success and failure.

¹⁶ A very readable and suggestive study is S. E. Morison's *Builders of the Bay Colony*. Boston and New York: Houghton Mifflin Company, 1930.

When the slackening of this migration threatened depression after 1642, the Colonists were sufficiently well established, and possessed among themselves enough skill and business experience, to take advantage of those commercial and industrial opportunities on which the prosperity of the region was thereafter to rest. The means were at hand for an increasingly successful experiment with a locally based fishing industry that stimulated allied industrial efforts like shipbuilding, and so provided an expanding market for agricultural produce. A further outlet was found in the supply of meat and grain to the West Indian plantations, where from about 1640 more and more land was put to sugar at the expense of food crops. The New England Colonies had come closer than any other to realization of that combination of interrelated agricultural, industrial, and commercial endeavor that had inspired English hopes for settlement since the days of the Hakluyts. And as the record repeatedly suggests, the earliest promoters of the American venture had been correct in their estimate of the commercial advantages that might proceed from settlement, but had overestimated the aid to be expected from trade in the initial stages of settlement.

When the Puritans took charge of the Massachusetts Bay Company, an organization fundamentally no different from the Virginia Company except for the smaller scale of its ventures as heir to the Dorchester project at Salem, they took also the extraordinary step of carrying the company and its charter with them to New England. Accordingly, there was left in England no superior promotional organization holding a prior claim to the land and the benefits of its settlement. The leading investors in Puritan colonization, in fact, migrated with their capital to New England, and by this act transferred the chief claims against the enterprise to the Colony itself. Necessary promotional work in England was effected through associations that sprang principally from a community of religious interest and purpose. An integral part of many such associations was the congregation, and the same unique collaboration of ministerial and lay leaders that so distinguished the political and religious life of the Puritan Colonies. It was not uncommon for a large part of a congregation by agreement among its members to migrate and settle in America under the leadership of its minister and elders. It is interesting to note that Edward Gibbon Wakefield, leading figure in the much later colonization of Australia and New Zealand, found in the organization and promotion of the Puritan settlements virtually the only model in the entire earlier story of English colonization that was in his judgment worth copying.¹⁷ In New Zealand he even relied upon a

¹⁷ Students of American settlement will find much of interest and value in the story of later English settlement in these and other Dominions. Some of the best accounts, and for the most part by Dominion scholars, are found in the *Cambridge History of the British Empire*.

similar community of religious interest as the foundation for two of his most interesting experiments. He viewed with particular approval, also, the diverse benefits of New England's town or village type of settlement.

The early projectors of English settlement had never had any other thought than that their people would settle in relatively compact communities, permitting and perpetuating many advantages for the commercial, religious, and cultural life of the Colony. It was the familiar pattern of life at home, and considerations of security from Indian attack alone were enough to recommend such procedure. Indeed, many of the communal features of earlier experiments, none of which bears any relation whatsoever to modern communism, had been shaped by a desire to assure the fullest enjoyment of the rewards of individual endeavor by establishing first the manifold opportunities and services of community life. Elsewhere, however, misfortune, the failure of ill-conceived plans of settlement, loosely administered land policies encouraging speculative holdings, the quickly demonstrated superiority of European weapons and military organization over the native, the imperious demands upon the soil of a crop like tobacco, or such influences as the easy access to marketing facilities provided by the Chesapeake waterways, had encouraged a dispersal of settlement that promptly made of the isolated farmhouse a familiar feature of the American scene. In New England the cohesive forces of community life proved stronger. The congregation was often older than the town in which it settled. Much more frequently did men migrate to America, and from Massachusetts to Connecticut, as members of a group bound together by a compact among themselves that presents subtle and significant differences from the type of individual contract commonly made with some promoter for settlement in the other areas. The New England Colonists, moreover, had well conceived and faithfully administered a plan of town settlement that fortunately proved well adapted to the economic opportunities of their geographic location.

In a very real sense the community under this plan was first organized and then settled. Since the charter had been brought to Massachusetts, the control of land grants rested entirely in the hands of local authorities. Grants were issued to groups organized for settlement in townships. In keeping with the usages of Puritan migration, the leaders of the projected settlement assumed a primary responsibility in negotiating the necessary arrangement with the Colony's authorities, and it was only natural that for the sake of legal clarity the grant should be issued in the names of these men, who as the "proprietors" of the town were charged with superintending the actual work of settlement. Under the direction of this committee, allotments of land were made to the several members of the community. Grants were based on the size of a man's

family, his social station, the extent of his investment in the project, and other considerations, including the general rules of the Colony. Voluntary joint-stock associations frequently proved here, as they had in Virginia, a convenient instrument of group settlement, and were especially common in Connecticut. Where such joint-stock agreements existed, they governed in great degree the division of the land. The transplanted Massachusetts Bay Company served primarily as the framework of a commonwealth, and lacked the usual profit-seeking motives of other such corporations. Elsewhere in New England, settlement was commonly undertaken without a royal charter and often in defiance of prior chartered rights. Land policies, therefore, were shaped principally by the desires of the settlers themselves, and men usually held their land free of quitrents and other encumbrances of the sort. Aside from this point, however, a more orderly and equitable distribution of the land rather than an underlying difference in principle distinguishes New England's settlement from those of other sections.

Wherever settlers from New England migrated thereafter, they were inclined to transplant the town organization so characteristic of their Puritan background. In Puritan procedure, too, is found the pattern of the attempt to write into the Northwest Ordinances of the 1780's principles of orderly and progressive settlement in the West. That these very ordinances were enacted partly because of speculative hopes rooted in New England itself need occasion no astonishment. Though the earliest town proprietors administered their offices with a real sense of community responsibility, the form of organization was easily corrupted in later days to serve the familiar purposes of speculation in frontier lands. Associates might procure a town grant on the legal assumption that they would promote its settlement; but, as with grantees in other Colonies, a loose administration did not demand it.

Promotional Policies

So much of America's land fell into the hands of speculators that it is easy to accept the mistaken assumption that the promoter's role throughout was essentially parasitical. In closing, therefore, the very real promotional work they accomplished and its great importance to American settlement should be recalled. In colonization as in other undertakings, someone must take the initiative and assume the responsibilities of leadership. No surer discipline in the exercise of such responsibilities has been found than to join them with a hope for personal gain. On this principle rested the administrative arrangements for American settlement, and whatever faults of human nature may have appeared, a magnificent achievement stands too in the record. Though that record is written in a language that today seems quaint, the student of history finds there principally a chronicle of business acumen and

skill. The Elizabethan adventurers, returning from America with an Indian or two to parade in the market place and on Sunday to church, could teach our modern advertising expert more than one lesson in the stimulation of popular interest and the presentation of a project in the most favorable light. Broad-sides, ballads, and skillfully composed tracts were distributed by printers employed by the promoters for the purpose. The aid of playwrights was enlisted, and Raleigh in 1585 even sent a first-class artist to Roanoke Island to paint the life and scenes of "Virginia."¹⁸

By such methods countless numbers of persons were made aware of a new opportunity and a new hope. The terms of settlement offered were necessarily favorable. Social, religious, and political barriers to advancement in the old world were repeatedly ignored; and in this necessity is found a root cause of that political and religious liberalism that was to become so characteristically American. Much of the story is summed up in the career of William Penn. A great advocate of political and religious freedom, he is perhaps even more significant as a promoter possessed of consummate skill. He was the first to extend a well-organized promotional campaign to the continent of Europe to enlist the aid of thousands of persons of non-British stock in the English settlement of America. And his effective joining of political and religious guarantees with the promise of economic opportunity represents, at one and the same time, the perfection of a promotional technique and the enunciation of a public policy no less important to our economic than to our political development.

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¹⁸ John White, possibly the same John White who served as governor of the "lost colony" of 1587.

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CHAPTER 3

The Organization of Production During the Colonial Period

IN 1680, IN ANSWER TO THE QUERY, "What obstructions do you find to the improvement of the trade and navigation of your Corporation?" the governor of Connecticut replied: "The want of men of estates to venture abroad, and of money at home for the management of trade, and labor being so deare with us." With an economy of words scarcely typical of the period the governor had succinctly stated the problem of Colonial production. The lack of capital and the scarcity and high cost of labor were principal obstacles to the rapid expansion of Colonial productive enterprises. In the year 1680 the Colonists were not as yet fully cognizant of the effect that economic nationalism would have on braking Colonial enterprises competing with home industries. When they fully awoke to its import to their economy, the voices of producers joined the chorus of protest led by merchants and land speculators.

Natural Resources and the Extractive Industries: Agriculture

Although handicapped by scarcity of capital and labor, by poor marketing and transportation facilities, and by political regulation, Colonial productive enterprise was given impetus and sustained by the abundant natural resources of the Atlantic Seaboard. Colonial production centered chiefly in the extractive industries requiring little machinery and using, in the main, unskilled or semiskilled labor. The soil provided crops and minerals, the forests timber, fur-bearing animals, and game, and the coastal waters, rivers, streams, and lakes a wide variety of fish.

Of Colonial productive enterprise, agriculture was the leading occupation and principal source of wealth; and down to the end of the Colonial period the population remained predominantly rural. On the eve of the Revolution, Boston and New York each had approximately 20,000 inhabitants; Newport 9,000; Philadelphia the largest Colonial town, 35,000; and Charleston, the largest city in the South, under 15,000. Other towns averaged between 1,000 and 4,000 inhabitants, and the

greater proportion of the population lived in villages, on farms, or on plantations.¹

The organization of the Colonial farm was determined far less by traditional European practices than by such factors as topography, climate, rainfall, fertility of the soil, and specialization. Little of the New England land was level or especially fertile. Great stretches of it were strewn with boulders. Hence, the bulk of the land did not lend itself to remunerative farming or to as intensive specialization as did the plantation economy. At least superficially, New England villages resembled medieval English farming communities. Much of the English village economy was transplanted, each family having its own home lot of three to five acres with outlying fields, generally several small tracts totaling from 50 to 200 acres, of which only a very small portion was as a rule arable. The common, or pasture land available to all freeholders, was copied from the English village plan. For generations the uneconomical three-field system of crop rotation was practiced in New England. The same ground might be planted to corn or sowed to flax and oats year after year until it "ran out." But improvement in farming methods followed the development of town and city markets. New England turned to the growing of diversified crops. Among these, Indian corn was the favorite since it could be cultivated by hand labor, whereas wheat could be grown only after the land had been thoroughly plowed. In addition, oats, rye, and barley were raised, and some attention paid to dairy farming and sheep raising.

The region between the Hudson and Potomac possessed advantages in soil and climate that soon made it the outstanding area for general farming along the entire Atlantic Seaboard. Wheat instead of corn was the important staple, but rye, oats, barley, and other cereals were raised in abundance, as well as fruit and vegetables. In addition, potatoes were extensively grown. The region was also famous for the excellent quality of its livestock and horses. While subsistence farming prevailed in New England, the "bread colonies" exported most of their crops. Flour was produced for foreign sale, together with other foodstuffs from wheat. In the seventeenth century the manufacture of flour and bread was the chief industry of New York City, where for a time all flour exported from the province had to be bolted or sifted, thus giving the local merchants control of the flour trade. Finally, this monopoly was broken, but as a consequence of the spread of fraudulent practices, such as the mixing of flour with Indian corn and the false "taring" (marking the weight) of bread and flour casks, the reputation of New York products suffered in foreign markets. Pennsylvania's pro-

¹ See E. B. Greene and Virginia D. Harrington, *American Population Before the Federal Census of 1790*. New York: Columbia Univ. Press, 1932.

vision industry was the chief beneficiary of New York's loss of prestige and customers.

In the South, where agricultural staples were produced primarily for a commercial market, farming was more of a capitalistic enterprise. The planter raised a specialized crop for export—in Maryland and Virginia tobacco, in South Carolina rice. He himself did not work the soil, but employed an overseer who managed the labor first of indentured servants and ultimately of Negro slaves. His economy was highly sensitive to the world price of his staple, and he became largely dependent upon credit from merchant capitalists in England and Scotland. Such credit made it possible for him to purchase new lands as his soil gradually became exhausted, to maintain the large labor supply that capitalistic agriculture demanded, and to preserve a conspicuously high standard of living. As production was sometimes limited to a fixed number of plants per laborer, old grounds would be abandoned when their declining yields increased labor costs. Hence, geographic shifts westward marked tobacco production, and by the mid-eighteenth century the industry was beginning to expand beyond the Fall Line. Notwithstanding the decline in the price of tobacco, production expanded rapidly. Average exports from Virginia to London around 1640 amounted to 1,395,063 pounds, not including a considerable quantity carried directly to Holland, whereas on the eve of the Revolution the exports to Great Britain exceeded 100,000,000 pounds. Capitalistic agriculture and the plantation system were also successfully instituted in the Carolina rice fields, where Negro slave labor was soon found to be more successful than indentured servants in coping with the hot, pestilential swamplands. The planters maintained residences in more healthful locations, leaving management in the hands of overseers. By the beginning of the Revolution, South Carolina and Georgia exported annually 165,000 barrels of rice.

While production on the plantations was in large measure centered upon staples, attention came to be devoted to diversified crops raised on partly exhausted lands. In the eighteenth century the Southern Colonies showed a large increase in the production of corn, wheat, and other cereals, and in the raising of cattle, sheep, and hogs. In addition, a good deal of manufacturing was done on the plantation. Many plantations supported their own tanneries, produced cloth from flax, wool, and cotton, both for home consumption and for neighborhood exchange. Hogsheads, barrels, and tierces were manufactured for exportable products. Other industrial activities, such as brewing and the manufacture of bricks, rope, salt, powder, potash, and hardware were undertaken. As a result, many of the slaves on the plantations were employed in nonagricultural labor and manufacturing processes.

The organization of agricultural production was reflected in the real-

property law of the Colonial period. The Colonial charters granted tenure in free and common socage. In general, farmers sought freehold grants, since their primary purpose in coming to this country was to secure holdings relatively free of feudal obligations. Where, as in New York, the manorial system and tenant farming were practiced, immigration lagged. Elsewhere feudal services were generally limited to the reservation of a specific quitrent. Everywhere quitrents were resented and though the amounts were nominal, their collection proved to be a formidable task. After the Revolution most feudal incidents, including quitrents, were abolished by statute, and a fee simple vested in the freehold tenant. The small holdings of New England were reflected in laws that provided for divisible succession among the male heirs, saving a double portion for the eldest son. This was a substitute for the English system of primogeniture, by which the eldest son was the exclusive inheritor of the land. Pennsylvania, which encouraged immigration and built up a prosperous farm population by generous freehold grants, followed New England's suit, but New York and the South clung tenaciously to primogeniture until the Revolutionary period. Virginia, under the leadership of Thomas Jefferson, was first of the group to abandon this method of descent. Holdings in the Middle Colonies and the South were frequently entailed, so that the large plantations were preserved intact for generations. Abolition of entails or barring them by deed or will was another achievement of the social legislation of the Revolutionary period. Finally, throughout the Colonies confiscation of the great Loyalist estates, such as the holdings of the Penn family, of Pepperell, Philipse, De Lancey, Fairfax, and Granville, led ultimately to a more equitable distribution of landholdings in all the Seaboard states.

Deposits of furnace clay, sand, and lime in certain areas made possible the glass industry in the Colonies. The location of brick and tile yards and potters' kilns was determined by the availability of suitable deposits. Bog ores found in eastern Massachusetts and along the New Jersey coast were well adapted for making castings and hollow ware. Rock ores, found principally in northern New Jersey, eastern Pennsylvania, and the South, gave rise to the furnace and forge industries of those regions.

Forest Resources and Industries

From the virgin forests of Colonial times sprang such enterprises as the fur and lumber industries, shipbuilding, and the production of naval stores and potash. Fur-trapping remained largely in the hands of the Indians. The white traders in exchange for pelts offered guns, axes, knives, ammunition, blankets, and gewgaws at such inland trading posts as the Dutch frontier post of Fort Orange, which later became the English

fur center of Albany. Here furs were obtained from the Iroquois, who acted as middlemen in procuring pelts from Indian hunters and trappers of the interior of the country. In the eighteenth century, Albany traders traveled all the way to Oswego on Lake Ontario to procure furs obtained from remote Indian tribes. In the South, Charleston and later Augusta were important trading posts to which huge quantities of deerskins were brought. The rivalry between the English and the French over the trans-Appalachian fur trade broke out in the contest between the French fur merchants and the Hudson's Bay Company in Canada. This rivalry was ended by the Treaty of Paris of 1763, which assured Britain's supremacy. In the eighteenth century, traders and trappers could no longer obtain furs along the coast, but found it necessary to penetrate the area of the Great Lakes, the upper waters and tributaries of the Ohio, and, in the South, as far west as the Mississippi. Most of the furs of the Thirteen Colonies were of the cheaper sort—muskrat, marten, and raccoon. Far more valuable were the otter, beaver, mink, fox, wolf, bear, and wolverine obtained from Canada. With Britain's acquisition of that area the fur industry of the Colonies declined in importance. Something less than 5 per cent of the beaver skins shipped to Britain in 1773 came from the Thirteen Colonies, and but slightly over 40 per cent of the total of other furs.

The timber resources of the Colonies fed a flourishing lumber industry—shipbuilding, the production of naval stores, and potash. In New England white pine supported the shipbuilding industry, prize trees serving as masts, yards, and spars for the royal navy, which was hard-pressed to get timber from the Baltic countries. The white oak of the Middle Colonies provided valuable stock for the cooperage industry as well as excellent ship timber; and other hard woods of that area, such as walnut, cherry, and red maple, supported the cabinetmakers' trade. In the South yellow pine was the principal source of tar, pitch, and turpentine. The commercial manufacture of lumber was confined to the Fall Line in New England and the Middle Colonies, the most important centers being Maine and New Hampshire.

Fishing and Whaling

The resources of the land were supplemented by the bounties of the sea. Fish, notably cod, caught off the banks from Newfoundland to Long Island, found a ready market. The better grades were shipped to Europe; the inferior went to the West Indies for the slave population. "Our ancestors," declared a Marblehead fisherman, "came not here for religion. Their main end was to catch fish." By the eve of the Revolution a fleet of well over 100 vessels employing over 1,000 men and shipping half the dried codfish of New England was based in Marblehead. This control of almost a sixth of all the vessels engaged in the New England cod fishery and a quarter of all the crews, represented a relative

degree of centralization of the industry. Whaling competed for the attention of the seamen of New England and New York. Offshore fishing first provided the Colonies with oil, but ultimately deep-sea whaling took the vessels out into the Atlantic Ocean from Hudson's Bay to the Falklands and from Africa to Brazil. Nantucket, New Bedford, and Sag Harbor led the Colonies in this industry by the time of the Revolution, when a fleet estimated at 360 ships accounted for some 45,000 barrels of sperm oil and 75,000 pounds of whalebone. Declared Edmund Burke in the House of Commons: "Neither the perseverance of Holland nor the activity of France nor the dexterous and firm sagacity of English enterprise ever carried this most perilous mode of hard industry to the extent to which it has been pushed by these recent people."

Until the end of the Seven Years' War, the French competed with American and English fishermen off the Great Banks, but the acquisition by the Treaty of Paris of all French territory in that area except the little islands of St. Pierre and Miquelon left Britain in control. As a result of the removal of a foreign rival, Britain and her colonies now entered into such fierce competition that in 1775 an English writer asserted that "the Northern colonies have nearly beaten us out of the Newfoundland fisheries, that great nursery of seamen; insomuch that the share of New England alone exceeds that of Britain." While New England sold a goodly portion of her fish and other products to the British West Indies, she was forced to turn to the French West Indies for molasses to be made into rum in the New England distilleries and shipped to Africa in exchange for slaves. The British West Indies could no longer provide supplies of molasses adequate to the demands of the Northern Colonies. A more rigid enforcement of the Navigation Acts and the passage of the Molasses Act in 1733 and the Sugar Act in 1764 were intended to counteract the trade with the French. The former act imposed duties on foreign sugar, rum, and molasses entering the Colonies. The latter reduced the duties on foreign molasses, but increased the duties on foreign sugar and prohibited foreign rum. Henceforth, serious attempts were made to check smuggling. The attempt to curb New England's commercial expansion centering about her fishing industry was one of the basic factors leading to the American Revolution.²

The Labor Problem and Colonial Production

The productive capacity of the American Colonies was materially affected by the power of the labor market. Because of the scarcity of labor, particularly of skilled workmen, this market favored the laborer rather than the employer. Colonial workmen commanded wages from

² By the Treaty of 1783 New England fishermen were given the right to fish off the Great Banks and other banks of Newfoundland, and in the Gulf of St. Lawrence as well as permission to dry or cure fish in specified unsettled areas in British Canada. For a recent thorough treatment of the problem, see H. A. Innis, *The Cod Fisheries*. New Haven: Yale University Press, 1940.

30 to 100 per cent higher than the wages of contemporary English laboring men.

Economic nationalism entered into the problem of the labor market as well as other problems of economic enterprise, and created a policy marked by sharp contradictions. Colonies were favored, but at the same time an effort was made to maintain a large labor supply at home in order to assure low wages and manufacturing costs. The home authorities sought to encourage early colonization. Master guildsmen and merchants sponsored the settlement of Virginia. It was widely believed, although now we know erroneously, that England was overpopulated, and that the unemployed, poor, and vagrant class should be shipped to the Colonies to produce the raw materials needed at home and to consume England's surplus manufactured products.

Following the Civil War and the Stuart Restoration, the official attitude gradually changed. As England rose to great commercial and industrial power, she was not anxious to encourage the emigration of good workmen, preferring instead to export convicts. For many years Parliament was loath to encourage the activities of recruiting agents by giving them immunity from civil actions for damages brought by persons claiming to have been transported to the Colonies against their will. Reluctantly such immunity was granted, provided that the agents had secured from such persons and had properly recorded testimonials of their willingness to depart. In 1765 Parliament forbade the emigration of skilled workingmen, as a means of preventing the spread of closely guarded industrial secrets and of maintaining an adequate supply of highly trained labor at home.³ This act anticipated the British statutes of 1774, 1781, and 1782 forbidding the exportation of textile machinery, plans, or models.

Because of restrictions imposed by the home government and certain other difficulties, chief of which was the formidable transportation problem involved in populating the Atlantic Seaboard with European workmen, it was necessary for Colonial production to draw upon sources of labor other than the free workingmen. Bound white labor and Negro slavery filled the huge gap in the labor market.

Indentured Servitude

Bound laborers were contracted under articles of indenture to serve for specified terms, generally from three to seven years, in return for

³ Only a few years later General Gage, commander-in-chief of the British military forces in the Colonies, wrote to the home authorities: "It would be well, if the Emigration from Great Britain, Ireland and Holland, where the Germans embark for America, were prevented; and our new settlements should be peopled from the old ones, which would be a means to thin them, and put it less in their power to do Mischief." From C. E. Carter, ed., *Correspondence of General Thomas Gage* (2 vols.), Vol. II, p. 450 (1768). New Haven: Yale University Press, 1931, 1933.

maintenance and certain "freedom dues" at the expiration of service. These freedom dues were established both by law and custom and generally amounted to working tools and clothing. Of the various sources of bound labor, the recruiting of immigrants, British, Irish, and German, was numerically the most important.

The financing of imported labor came either from the planter, as in Virginia and Maryland, who received a headright or land grant for each immigrant brought into the country, or through recruiting agents in England and on the Continent who were employed by merchants specializing in the sale of servants' indentures. Zealous recruiting agents went through the Rhineland areas—devastated by the Thirty Years' War and the War of Legitimacy—and gained the name of "Newlanders," a term of opprobrium. English recruiting agents sent drummers through various inland towns to cry publicly the voyages to America, or distributed extravagant literature at annual fairs with the help of a piper who drew the crowd. These agents were often guilty of sharp practices. After securing the signature of the immigrant to the indenture, the agent would frequently confine him in a "cookes house," or actually imprison him aboard ship to prevent his breaking his contract before sailing time. This treatment led to frequent charges of "spiriting," which, while unquestionably exaggerated, were unfortunately true in the case of unscrupulous agents who were not beneath kidnapping children and "trepanning" or shanghaiing adults.⁴

The average cost of transporting a passenger across the Atlantic was £10. To pay his passage, the immigrant workingman signed an indenture with the recruiting agent to serve, generally, a term of two or three years. This indenture was assigned to the ship's captain, who would sell the passenger on his arrival at a Colonial port. Immigrant workmen coming into the Colonies in this way were known as *redemptioners*. South of New England, which was largely Anglo-Saxon, some 50 per cent of the population was of non-English stock at the time of the Revolution. In general, this meant that the majority of the Scottish, Scotch-Irish, Irish, German, and Swiss immigrants came to this country as indentured workmen bound for their passage money. Pennsylvania received the lion's share of this immigration.

A numerically smaller but still important element in the unskilled labor market was the British convict, exported principally to Maryland and Virginia. Parliamentary acts of 1662 and 1717 specifically authorized this disposal of convicts. Under the first act "rogues, vagabonds, and sturdy beggars" might, if adjudged incorrigible, be transported. The second authorized the transportation of persons convicted of lesser

⁴ See A. E. Smith, "Indentured Servants: New Light on Some of America's 'First' Families," *Journal of Economic History*, Vol. II, (May, 1942), pp. 40-53.

crimes for seven-year terms of servitude, and of those guilty of offenses punishable by death to fourteen-year terms. In addition, a great many political prisoners convicted of participation in the Monmouth rebellion and in the uprisings of 1715 and 1745 to establish the Pretenders upon the throne were sent to this country. All told, about 50,000 convicts were shipped to America, of whom 20,000 went to Maryland. Women of the Moll Flanders type, men from out of Hogarth, still other characters, like the notorious university book-thief, Henry Justice, barrister and bookseller, made up the motley throng of convicts. They aroused a general feeling of insecurity in the Colonies to which they were transported and added immeasurably to the crime problem. Moreover, the bulk of them were unskilled workers, not distinguished for industry and obedience. Despite Colonial opposition, manifest in laws imposing prohibitive duties upon the importation of convicts—all of which were disallowed by the Crown, which favored wholesale convict dumping—marginal farmers and frontiersmen who could not afford to purchase slaves found convicts to be a cheap source of labor and doubtless made it profitable for this practice to be continued right through the Colonial period.

Besides the British convicts, American Colonists convicted of such criminal offenses as larceny might be permitted to serve as indentured servants to pay the damages or fines assessed. Extra service was regularly exacted also of runaway servants and of women servants bearing illegitimate children. Finally, orphans and child-paupers could be bound out by the courts to save communities the expense of their maintenance. A further source of bound labor in the Colonies was the judgment debtor. In England imprisonment for debt had long been the fate of impecunious debtors; but in this country, where labor was scarce, such confinement served little purpose. Hence, very early in Colonial history courts began the practice of discharging debtors from prison provided they would serve their creditors or assigns for a period of time deemed sufficient to satisfy their debts.

The indenture by which the labor of immigrants was contracted usually did not carry an obligation on the part of the master to instruct them in a particular craft or "mystery." Bound servants worked at miscellaneous jobs about the household and farm. Indentures that did bind the master to give the artisan instruction in reading, writing, and accounting, as well as training in a particular trade, were known as "articles of apprenticeship." These were entered into by minors with their parents' consent. In return for their training, the apprentices were bound normally until their eighteenth or twenty-first birthday to live with and work for the master. In the absence of vocational schools, this was the only method of producing skilled workers, and the provisions of apprenticeship were in the main carefully guarded by the courts.

Slavery

Bonded servitude preceded slavery in the South. Slavery became firmly established, however, within a generation after the first Negroes were brought to Virginia in 1619. Slaves were generally first landed at the West Indies and seasoned before being sold in the mainland colonies. By the end of the seventeenth century, the slave population had rapidly mounted. They were confined in the main to employment in the Southern plantation economy. While the bulk of them were used for field and household labor, others were trained in a variety of trades and often farmed out by their masters. The skilled Negro artisan was, therefore, a serious threat to the free Southern workman in such towns as Charleston. Ultimately he entirely replaced the free workman in the supply of skilled labor in the South. The increase in rice and indigo production in the South boosted the price of slaves. The average price in 1650 was £20 a head, in 1700 £25, and by the eve of the Revolution between £50 and £80. The tobacco planters, harassed by the declining profit margin from their product, by soil exhaustion, and by the mounting burden of fixed charges and debts, found the high price of slaves a serious strain on their economy. Yet the Carolina planters felt that slave labor paid. The author of *American Husbandry* observed in 1775:

The price of labour is incomparably cheaper in Carolina than in Britain: a negro costs 2£ 13s. per annum, to which if we add 2£ 10s. the interest of his prime cost, the total is only 5£ 3s. and as the common calculation is, that one English labourer does as much work as two negroes, a labourer to the planter costs 10£ 6s. a year, whereas to a farmer he costs from 20£ to 25£. The difference is 125 per cent; this article therefore is very decisive in favor of the planter.⁵

The Control of Wages

This advantage did not hold in the case of white labor. All authorities agreed that relatively high wages prevailed in the Colonies. One discouraged New Englander wrote in 1660 that "help is scarce and hard to gett, difficult to please, uncertaine, etc." "Poor People," wrote Gabriel Thomas of Pennsylvania workingmen, "can here get three times the wages for their Labour they can in England." This high level of wages curbed to some extent the ability of Colonial producers to compete with English manufacturers; it rendered competition with Continental producers in some fields virtually hopeless without subsidies. It was reported in 1694 that in Sweden and Denmark, "Labour costs but one-sixth of the price as it does in New England." William Byrd 2nd abandoned plans for the introduction of hemp, because, he wrote in 1737,

⁵ Harry J. Carman, ed., *American Husbandry*, p. 302. New York: Columbia University Press, 1939.

"Labour being much dearer than in Muscovy, as well as the Freight, we can make no Earnings of it."

It might be assumed that high wages should have attracted many immigrants, and thus lowered the wage scale by glutting the labor market, but this was not the case. Agriculture, not industry, lured the Colonial workingman. As soon as he had accumulated a small amount of money he could, and in many cases did, take up a tract of land and settle on it as a farmer. The opportunity to acquire good land in freehold tenure rather than the prospects of high wages attracted immigrants to the American Colonies.

Early Colonial governments attempted to cope with this problem. Endowed with broad powers of supervision over strangers, vagrants, and the idle, with authority to establish compulsory labor, and the right to impress men to pursue fugitive servants on land and over water, they also experimented for several generations with a program of fixing maximum wages. Virtually every Colony sought such a solution, but the New England group was the most persistent. To prevent a fixed wage base and a runaway price scale from throwing the labor system out of equilibrium, early statutes included elaborate regulations of the prices of basic commodities. The early settlers accepted in general the medieval doctrine of the "just price." The assize of bread was the most persistent regulatory measure employed in American towns down through the eighteenth century; but other price, quantity, and quality regulations included the assizes of casks, leather, wood, and bricks. The attempt to control wages, either by legislative fiat or the administrative discretion of local officials was generally abandoned, even more rapidly than in England where the system had become largely ineffective by the latter part of the seventeenth century.

In the face of the rapid depreciation of paper money during the American Revolution, the various state governments once more attempted to set maximum wages and prices. Regulations were drawn up by state legislatures and regional conventions and relied for sanctions primarily upon the boycott and social ostracism. They failed, not because of the impossibility of regulation *per se*, but rather because of the failure of the Continental Congress and the states to stem the currency crisis. Without a stabilized currency, control of wages and prices proved impossible.

Because of this failure, economic thinkers of the "critical period," such as Pelatiah Webster, were generally committed to a hands-off business policy. Abolishing internal restrictions on business, while at the same time effectively regulating commerce between the states and protecting home industry from foreign competition would, according to early American entrepreneurs, assure a revival of prosperity. This view was reflected in the framing of the Constitution, a document enthusi-

astically endorsed by the industrialists and city workingmen of the time.

Concerted Action Among Workers

After 1689 British workingmen began to act in concert to secure better working conditions. Doubtless owing to the fluid character of the Colonial labor market, workingmen's combinations in Colonial times were at best temporary affairs, generally confined to the licensed trades, such as those of the carters and porters whose fees or wages were set by the town authorities, or of the master bakers who frequently acted in concert to protest against the town assizes. During the Revolutionary era, a perceptible momentum toward labor combinations and concerted action along class lines was effectively diverted from economic into political channels. Masters and journeymen joined in protest against British imperial policy and supported the nonimportation agreements, which were a great boon to local industry. The foundations of permanent trade-unionism were not really laid until the post-Revolutionary period.

Nor were combinations of master craftsmen of permanent nature. The guild system never was successfully transplanted to Colonial soil. In 1644 the Massachusetts authorities placed shipbuilding under the supervision of a chartered company, following the English pattern, and four years later the shoemakers of Boston and the coopers of Boston and Charleston were given a charter of self-government conferring upon them the power to "suppress" shoemakers not approved by the guild. But in neither case does it appear that the charters were renewed at the expiration of the three-year period. Beginning with the Philadelphia house carpenters in 1724, master carpenters in most of the Colonial towns agreed upon a scale of prices for their work, and the practice of entering into and publishing such agreements was widely followed in the post-Revolutionary and Federal periods. By the "critical period" master silversmiths, coopers, wigmakers, and others were organized by crafts. Master mechanics were combining in the leading towns to establish inter-craft organizations for economic as well as philanthropic ends.

For a long time Colonial towns strove to maintain the monopoly of the crafts by making the completion of a term of apprenticeship a prerequisite to opening up one's own shop, or by limiting practice in trades and crafts to inhabitants admitted to the freedom of the town. In 1675 a group of ships' carpenters were fined by the county court for riding an interloper out of Boston on a rail because he had worked in the yard before completing his full seven years' apprenticeship. By the mid-eighteenth century, however, *laissez-faire* tendencies led to a noticeable slackening in the enforcement of these restrictions. New York, which had been vigilant in protecting its coopers against outsiders from Boston

in 1675 refused flatly to intervene when in 1747 building-trades workers complained that carpenters, bricklayers, and others coming in from New Jersey not only worked at much lower wages but brought in their own building materials. The South was unable to prevent Negro slaves from driving the more highly paid white artisans out of the labor market.

The Investment of Capital in Productive Enterprise

Capital invested in Colonial productive enterprises was drawn both from European and from Colonial sources. The Lynn iron works was started in the seventeenth century with English as well as Colonial money. British ironmasters organized the Principio Company in Maryland and Hasenclever's short-lived undertakings in New York and New Jersey. English merchants supplied the initial capital for the New England fishery, but control rapidly passed into the hands of resident settlers. English capital also underwrote a large part of the New England ship-building industry.

In the American Colonies the capitalist class was not comprised principally of manufacturers. Merchants, landed proprietors, and office-holders made up its ranks. They found safer and more attractive types of investment than manufacturing. They invested their surplus incomes in real estate or else in British Government securities, which were considered more conservative than industrial enterprises. In the course of time, however, Colonial merchants saw the possibilities of profit from lumber and flour mills, sugar refineries, breweries, distilleries, potash and pearlash works, iron furnaces and bloomeries. The entrepreneur of the type of Robert Morris, who financed shipping ventures, merchandising, road and canal building, and land speculation, was rarely found in the Colonial period. With the advent of the Revolution, however, industrial promoters rose to considerable prominence. William Duer was probably chief among them. His financial ventures included a timber project, financing of supplies to the Continental troops, promoting land and stock speculation in the "critical period," and joining with other promoters in backing the Society for Establishing Useful Manufactures, founded in 1791, one of the pioneer industrial enterprises of this country.

As compared with modern times, relatively more capital was needed in the Colonial period for operating a manufacturing enterprise than for fixed investment. The large amount of working capital was necessary because of the slow processes of manufacture and the delayed return from sales resulting from transportation problems and long credits. Handicraft trades lacking capital were never expanded beyond the point of producing for the local community. The "putting-out" system of textile manufacture involved relatively little capital, while the factory system, which had not extensively developed at that time, required far more. Until a substantial merchant-capitalist group had been firmly established

in America, surplus capital for manufactures continued to be scarce and productive enterprises accordingly restricted in scope. The capital invested in productive enterprises might vary between \$500 and \$1,000 for a sawmill to \$250,000 for an iron works.

The scarcity of capital encouraged high interest rates. Nevertheless, it must be kept in mind that the first call on the printing press was not made to satisfy the needs of productive enterprise but rather to meet public budgets increased by war emergencies and later by local fiscal conditions. The attempt to satisfy the desire for more money by issuing paper currency failed and brought with it rapid depreciation. Private paper-money issues were declared illegal in 1741. Ten years later Parliament forbade the New England Colonies to issue any bills of credit in the future and ruled that thereafter no bill of credit should be made legal tender. In 1764 this prohibition was extended to the rest of the Colonies. Coming at the end of a war and the beginning of a depression, this action was badly timed and aroused widespread resentment. Franklin stated that the restraints on paper money were one of the principal causes of Colonial disaffection.

Had the joint-stock company or corporation been employed more widely, capital for financing industrial ventures in the Colonies would undoubtedly have been available to a greater extent. But the individual investor rather than the corporation normally underwrote productive enterprises. Even when factories were started by public subscription, as were some of the textile companies set up during the nonimportation agreements, the public was suspicious that the entrepreneurs might seek to enrich themselves unduly rather than to carry out the major objective—the employment of the poor.

The principal public corporations chartered in the Colonies were the Colonial municipalities. The private corporations set up were mainly concerned with such nonprofit objectives as religious worship, philanthropy, and education. Business corporations were few in number. Land companies made up the majority, but a few commercial companies were chartered, such as the trading corporation set up in Connecticut in 1723, the wharf companies chartered in that Colony in 1760 and in Massachusetts in 1772, and a number of fire insurance and water supply companies. There were few industrial corporations. Some of the early mining companies, notably that of the Simsbury mines in Connecticut, were incorporated. The Revolutionary era witnessed the rise of a number of joint-stock companies for manufacturing. Of these the United Company of Philadelphia for Promoting American Manufactures, founded in 1775, was probably the most successful, but, by and large, the joint-stock company was not the medium for financing productive enterprise in the Colonial period.

While the corporate type of organization was not usual in industry,

the risks of enterprise were at times shared by the entrepreneur with the workers. Fishing, whaling, and privateering are the best examples of this type of business organization; the seamen by waiving their claims to regular wages in reality contributed substantially to the financing of the enterprise. The financial return to the seaman took the form of a "lay," or a fractional share in the net proceeds of an entire voyage. In fishing voyages the master and men customarily received one-third of the fish, and the remaining two-thirds went to the owners. In whaling expeditions a green hand commonly started with a lay of 1/200 of the catch, and captains received as much as one-tenth. But the workers had no part whatever in the functions of ownership or management. They shared to the full the risks of enterprise without being allowed the slightest part in the determination of those risks.

The Technology and Organization of Colonial Manufacturing

In the Colonial and Revolutionary periods, three stages of manufacturing existed side by side: household manufacturing, the prevailing system; the domestic or putting-out system, well entrenched by the middle of the eighteenth century; and the factory, developed under the stress of Revolutionary conditions. For goods produced mainly for local consumption and not requiring elaborate equipment, household manufactures or workshop crafts prevailed. Spinning and weaving of woolen, linen, or cotton cloth were common in most households, as was the making of homespun garments. As Victor S. Clark points out, as long as an operative was required for every spindle, as was the case of the hand-wheel or the Saxon wheel operated by a treadle, there was no economy in applying water power to spinning or any incentive to the setting up of factories. On the other hand, weaving required more mechanical equipment and greater skill, and therefore cloth making tended to become specialized and to be produced in workshops or factories. The farmers slaughtered their own cattle, cured and salted their meats, and, as by-products of this activity produced tallow, soap, lard, and candles. To the total volume of production in the Colonies household manufactures contributed a respectable proportion.

The Workshop Crafts

The prevailing mode of production in the Colonial towns was the workshop crafts. Normally making their products on order for customers, the master craftsmen did not require large inventories or stocks of raw materials. Because of failure to establish a permanent craft guild system, shortage of skilled labor, and the rise of *laissez-faire* tendencies, workers frequently performed more than one industrial process: the blacksmith was a toolmaker; the soap boiler a tallow

chandler; and, despite restrictive legislation, the tanner often acted as a currier and shoemaker. Such versatility was attained often through the sacrifice of quality. When John Julius Sorge advertised in the New York newspapers in 1755 that he could make artificial fruit, do japan work, manufacture cleaning fluid, toilet water, soap, candles, insecticides, and wine,⁶ there is no reason to believe that New Yorkers were taken aback by this display of diverse talents. Aside from the Jack-of-all-trades who was master of none there was also the highly skilled craftsman who was enterprising enough to branch out into other related fields. Paul Revere, renowned for carrying the messages of the Committees of Correspondence and the Sons of Liberty, was also a distinguished silversmith by trade. His sugar bowls and creamers, spoons and sugar tongs, medals and buttons amply demonstrate to posterity his mastery of his craft. But in addition, he was a well-known copperplate engraver, although not a very good one, a dentist who set false "foreteeth," a manufacturer of clockfaces for clockmakers, of branding irons for hatters, and spatulas and probes for surgeons. After the Revolution, while continuing his workshop craft of silversmithing, he branched out into large-scale industry, setting up a foundry, making brass cannons, casting bells—at which he was most proficient—and making hardware for ships, the most famous of which was the *Constitution*. Finally, in 1800 he set up a mill for rolling copper into sheets that is now one of the great copper establishments of the country.⁷

The Domestic System

The putting-out or domestic system developed in a few industries, notably in weaving and in shoe manufacturing. The weaver or shoemaker worked at home but was dependent for stock upon an entrepreneur who in some cases furnished implements as well. Spinning and weaving received a great impetus during the period when nonimportation agreements were in force. The Colonial towns began to concentrate intensively on the production of woolen, cotton, and linen goods. It is clear that in some cases the workers produced fabrics in their own homes from raw materials that they had raised themselves.⁸ In other instances, raw material appears to have been provided by an entrepreneur. The spinners of New York were notified in May, 1766 "that due Attendance will be given, every Tuesday, Thursday, and Saturday, in the Afternoon, to give out Flax and receive in Yarn" at the factory of Obadiah Wells in Mulberry Street. Apparently Wells not only engaged in the putting-

⁶ *New-York Gazette or the Weekly Post-Boy*, June 16, 1755.

⁷ For an interesting biography of the famous craftsman and patriot, see Esther Forbes, *Paul Revere: The Man and His Times*. Boston: Little, Brown and Company, 1942.

⁸ For example, in 1767 three individuals made in their homes in Woodbridge, New Jersey, 599 yards, 567 yards, and 414 yards, respectively, of woolen and linen cloth.

out system, but also hired factory operatives to work in his own plant, as he was compelled to announce that "to prevent Trouble, no Person who has not been an Inhabitant in this City ever since May last, will be admitted as a Spinner in the Factory."⁹ Finally, spinning wheels and looms were occasionally assembled in factories, as was the case with the "Manufactory House" opened by William Molineaux in Boston in 1769 and with two establishments set up in Philadelphia a few years later for the manufacture of cotton and woolen goods.

Shoes, also manufactured under the domestic system during the latter part of the Colonial period, were being produced for a wholesale market. By 1760 there were sufficient workers in the shoe trade as well as adequate capital to justify ventures on a larger scale in the domestic and foreign markets. Lynn, Massachusetts, was the most highly organized center for the domestic system in shoe manufacturing on the eve of the Revolution.

Mills and Factories

Lumber mills and gristmills, as well as the manufacture of glass and paper, early required the use of considerable machinery and the establishment of plants. The availability of water power was a factor in determining the location of such plants, although windmills were not uncommon. Power was used in a number of industries. For example, in paper mills it propelled two rollers that ran over an iron bed-plate containing macerating knives. By the eve of the Revolution power was applied to milling. The machinery perfected by Oliver Evans of Philadelphia for cleaning, grinding, cooling, bolting, and barreling grain without manual operation represents an early instance of complete mechanization of manufacturing, from raw materials to finished commodity. Under such a system, six men, mostly employed in closing barrels, could annually convert 100,000 bushels of grain into flour. Fulling and powder mills also employed water power.

By the eve of the Revolution, factories and mills were growing larger in size. Gristmills and iron works were employing greater numbers of workers. In New York City a small linen factory with 14 looms, a paper mill, a beaver hattery, a glass house, two breweries, a spermaceti candle works, and a number of shipyards were at work. A Trenton tannery had in 1778 64 vats, 5 limes, 2 water pools, a bark house, currying and skin dresser's shops, and facilities for making leather breeches. The mill and furnace industries, probably to a greater extent than other types of Colonial manufacturing enterprises, involved a considerable concentration of labor of a semiskilled character working along rather specialized lines under one employer. In addition, they required a heavy

⁹ *New-York Gazette or the Weekly Post-Boy*, May 8, 1766 (Supplement).

investment in plant and equipment. While almost any country blacksmith might improvise a bloomery, the expansion of iron manufacture demanded considerable capital for the building of ore furnaces employing water power, furnaces for remelting iron and making steel, and steel works, including steel furnaces, refining forges, slitting mills, and plating forges.

The fact that by 1775 the American Colonies had more blast furnaces and forges than England and Wales combined was largely due to the pioneering enterprise of Colonial ironmasters. These ventures were not always crowned with success. With the help of British capital and imported workmen, the scientifically minded John Winthrop, Colonial governor of Connecticut, eldest son of the governor of Massachusetts Bay, and first member of the Royal Society resident in America, set up in the 1640's a furnace at Lynn and another at Braintree. Later he expanded his ventures in New Haven Colony. He also developed lead and salt works, but none of these prospered despite liberal subsidies of land conferred by friendly Colonial governments, exemptions from all taxes, and exemptions of workers from muster duty. This small-scale development (the Lynn plant turned out eight tons a week in 1648) contrasts strikingly with the far more ambitious iron works established prior to the Revolution by Peter Hasenclever, who, reared in Prussia and trained in long hours of toil of a Continental steel mill, brought to his forge and furnace enterprises a broad commercial and industrial experience. Upon becoming a British subject, he formed a company with an initial capital of £21,000 and, coming to this country in 1764, set up in Morris County, New Jersey, Orange County, New York, and elsewhere mining and smelting works and potash plants. He supplemented these activities with raising hemp and flax. He tested mineral deposits, invested in extensive equipment, and constructed bridges and dams. As a result of careful preparation and intelligent organization, his company produced the best iron ever exported to England from America up to that time. Controversies with his English directors and long-protracted litigation led, however, to the failure of the Colonial enterprise, and Hasenclever spent his declining years in manufacturing activities in Silesia.

Even more glamorous was the career of Henry William Stiegel, ironmaster and glassmaker. Arriving in Philadelphia from Cologne in 1750, he was employed by an ironmaster in Lancaster County, married the boss's daughter, and after his father-in-law's death went into partnership with Charles and Alexander Stedman of Philadelphia to develop the Elizabeth Furnace. There he manufactured stoves and iron castings, and by 1760 had become the most prosperous ironmaster in the region. He invested in thousands of acres of woodland, erected tenant houses, laid out the town of Manheim, and gained the sobriquet of "Baron" because of his lordly manner of living. Upon his return from a visit to

England in 1764 he brought back a number of skilled glassmakers, and erected a glass factory at Manheim. In a second factory erected by him in that town in 1769, and known after 1772 as the American Flint Glass Manufactory, was turned out the renowned Stiegel glassware, in addition to window and sheet glass. But his extravagant and happy-go-lucky manner of living led to his financial undoing; and after going through bankruptcy in 1774 and spending some weeks in debtors' prison, he was reduced in his last years to working as a country schoolmaster and music teacher.

Similar to the factories of the industrial towns were the somewhat smaller works set up on numerous plantations in the Southern Colonies. George Washington had an establishment for the manufacture of woolen, cotton, and linen cloth employing at least one white woman and five Negro girls, and producing in 1768 some 2,000 yards of linen, woolen, and cotton cloth. Diversified economy, as it was developed on the plantations on the eve of the Revolution, turned many planters into mill and factory operatives as well as agriculturists. Epitome of these men of many affairs was the Virginia planter, Robert Carter, who, in addition to his holdings of 300,000 acres of land, held an interest in the Baltimore Iron Works organized in 1731. The partners either sold the iron produced or used it on their own plantations. Carter did both, manufacturing various iron implements in his own smithy, offering axes, broad hoes, plows, and nails for sale. He set up a fulling mill and employed ten Negro women at spinning wool in a tobacco house converted for the purpose. During the Revolution he engaged six white workers who were expert spinners and weavers, and proceeded to manufacture cloth, for which he erected a building 77 feet in length and 26 feet in width. Gradually Negro workers were trained to replace white artisans in that enterprise. A stocking weaver made hosiery which Carter offered for sale. When the depression of the 1750's and 1760's forced many planters to produce such other staples as wheat, corn, rye, and barley, Carter engaged in milling on an ambitious scale. He built a grain mill designed to grind 25,000 bushels of wheat a year and requiring £5,000 annually for its operation; in his two ovens 100 pounds of flour could be baked at one time. He also set up complete equipment for the manufacture of salt. So wide a variety of occupations throws out of perspective the traditional picture of the planter solely dependent upon the vagaries of the tobacco market for the livelihood of family and workmen.¹⁰ "I have a large Family of my own," wrote William Byrd 2nd of "West-over" in 1727, "and my Doors are open to Every Body, yet I have no Bills to pay, and half-a-Crown will rest undisturbed in my Pocket for many Moons together. Like one of the Patriarchs, I have my Flocks and my Herds, my Bond-men and Bond-women, and every Soart of Trade

¹⁰ See Louis Morton, *Robert Carter of Nomini Hall*, Williamsburg, Va., Colonial Williamsburg, Inc., 1941.

amongst my own Servants, so that I live in a kind of Independence on every one but Providence."

Economic Nationalism and Colonial Production

The British policy expressed in the imperial program of trade regulation was a manifestation of the intense economic nationalism of the period. Colonies were looked upon as sources of raw materials and outlets for the manufactured products of the mother country, whose export trade was to be encouraged by protecting manufacturers against high wages or excessive raw materials-costs and by providing subsidies to home manufacturing or to Colonial enterprises deemed essential to the home economy.

Some aspects of this program proved advantageous to Colonial productive enterprise. Shipbuilding benefited only slightly from the Navigation Acts, which discouraged, but did not forbid, the use of foreign-built vessels in the English merchant marine. Certainly even without this legislation Colonial shipbuilding could have held its own in free competition. By the time of the American Revolution, one-third of the ships in the British merchant marine were launched in the Thirteen Colonies, which were then turning out close to 30,000 tons of shipping per year.

Bounties to noncompeting industries served to stimulate Colonial production somewhat unevenly. Raw-silk production did not thrive in the Colonies, Georgia, the largest producer, shipping a little over 1,000 pounds of silk to England in 1773. Bounties also directed a quantity of lumber to Britain, although the chief market for American lumber products remained the West Indies. Production of naval stores showed the greatest response to bounties granted it. These bounties totaled £1,471,719; but, while the production of tar, pitch, rosin, and turpentine was appreciably advanced, that of hemp gained little momentum. The cultivation of indigo in Carolina and Georgia was unquestionably stimulated by a bounty totaling £145,032 for the years 1749-1773. After the Revolution, the competition of the British East Indies led to the virtual abandonment of the cultivation of indigo. The prohibition on the planting of tobacco in England was designed to encourage American production, but it does not seem to have had any noticeable effect.

Generally speaking, the restraints that British policy imposed upon Colonial productive enterprise outweighed the bounties and monopolies granted certain favored industries. The Navigation Laws, which required that tobacco be sent through Britain instead of directly to the Continental markets, worked hardship on the tobacco planters, since the greater part of the world price of tobacco now went to English middlemen. In 1773 Britain consumed less than 4,000,000 pounds of the 100,000,000 pounds imported, the remainder being re-exported, mostly to Holland and Germany.

The restrictions on Colonial industry were in the main as detrimental as were the controls placed upon the tobacco trade. The British Government paid premiums on masts, yards, and bowsprits, but at the same time its legislation forbade any cutting of white pine suitable for masts. In practice the King reserved for his own use all pines measuring 24 inches in diameter, three feet in height. Such trees were to be marked with the king's broad arrow by the surveyor-general of the woods. Respect for the royal mark was not too conspicuous among lumbermen. Loggers cut down reserved trees with impunity. The ensuing litigation was not advantageous to the lumber industry. The Colonists felt that to substitute a doubtful trade in naval stores for the profitable industry of timber cutting and board marking was poor business.

The act of 1699 forbidding shipment of Colonial wool or woollen manufactures outside the border of a colony does not seem to have restrained Colonial producers seriously. But this industry was throughout Colonial times largely confined to the production of homespun garments for local consumption. The act of 1732 barring exportation of hats, limiting each manufacturer to two apprentices, requiring a seven-year apprenticeship, and excluding Negroes from the industry appears to have hindered Colonial enterprise. Violations of the act were prosecuted in New York in the mid-eighteenth century. After the Revolution, the United States, freed from the restrictions of this act, began once again to export hats to foreign countries. Prohibitions on the erection of any additional slitting mills in the Colonies (1750) or on the exportation of Colonial iron outside the empire (1757) were openly defied, at least in Pennsylvania. Nevertheless, conservative investors were indubitably discouraged from entering a field of illegal activity. It must be borne in mind that, while the British Government opposed the Colonial manufacture and exportation of finished iron and steel products, it favored the production of Colonial pig and bar iron and granted these products preferential treatment when entering England.

Resentment on the part of manufacturer and workingmen over British policy was but one of the numerous causes of the final break with the mother country. Actually the regulations were never systematically enforced. But no other single issue was as well-calculated to unite master and workingman in opposition to the British Government. The non-importation agreements beginning with the Stamp Act were a great stimulus to Colonial production and the expansion of the domestic and factory systems.¹¹ The Revolution served to foster production at home

¹¹ A London paper of this period, reporting on some beautiful samples of cotton goods made in Philadelphia for export to London, as well as on American progress in other branches of manufacturing, commented: "by which it should seem, that our American colonies intend to shake off, by degrees, what they have long called a slavish dependence on the mother country." *Lloyd's Evening Post*, August 10, 1764.

for military uses. Colonial and Revolutionary producers blazed the way for the artisans and entrepreneurs of the next generation, such as Samuel Slater, who successfully developed and expanded the use of power-driven machinery and consequent mass-production methods.

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CHAPTER 4

Colonial Commerce and Commercial Regulation

IN THE OLD DAYS, it was the customs ledger, rather than the map, that determined the desirability of a colony. The time was far distant when whole deserts or vast stretches of wilderness would be annexed simply to bolster national pride by map-coloring. The choicest colonial possessions were often mere dots upon the map; but as long as they furnished their mother country with exotic goods that she could not produce at home and in turn consumed her exports, they were bones of contention in war and rich sources of profit in peace. For that reason England, at the close of her second naval war with Holland in 1667, almost took a tiny spice island instead of New York and New Jersey. That was also why, a century later, after the Seven Years' War with France, she debated long over the relative value of the little sugar island of Guadeloupe as compared with the whole of Canada.

The potential offerings of America were one of England's chief reasons for planting colonies across the Atlantic. Although these might not match the rich spice trade that the Portuguese had found in the East or the silver flood that poured into Spain from her mines in Mexico and Peru, her hopes ran high of obtaining other non-European products to render herself commercially independent of her rivals and to give her a surplus for sale abroad, to the enrichment of the nation. The glowing prospectuses of Virginia contained long lists of such economic dreams, while even the Puritans who came to more northern homes "for the good of their souls" anticipated profits from the sale of their Colonial products.

Dutch Commerce and Empire

During the half-century from 1600 to 1650, when England was establishing the foundations of her American empire, she was thoroughly overshadowed on the seas by Holland, a nation in her heyday as a maritime power. Those years of Dutch ascendancy must be taken into account, for in several ways they influenced deeply the growth of England's colonization. Holland and England had fought together to break Spain's monopoly of overseas activity; but once the Armada was shattered, Holland got off to a much quicker start. Not only did she crowd the English out of the spice islands, but all over the known world the Dutch were soon trading all things with all people. On the whole,

it was by energetic and intelligent business methods rather than by coercion and regulation that the Dutch grew rich. Other nations traded with them, not because they had to, but because the Hollanders would generally sell goods or carry them for fully a third less than could their own countrymen.

Amsterdam quickly rose to first place among seaports by developing the entrepôt game: that is, concentrating many routes of commerce at one port, so that the offerings of every land passed briefly over its docks and through its warehouses, to the great profit of its enterprising merchants, who naturally collected revenues from such handling. This device was ever the surest road to wealth for a maritime community. Furs and lumber from the Baltic, currants and fruit from the Levant, wines and silks from France, woollens from England, tobacco from Virginia, and the products of the German interior all paid toll to the Dutch in the form of commissions, insurance, freight, and the numerous other levies of commerce. Even when such wares did not actually reach Amsterdam, the chances were that they would be carried by the ubiquitous ships of the Dutch merchant marine. Nor was this simply selfish exploitation on the part of the Dutch: they gave service and helped others to profit in the process. With an uncanny nose for scenting new opportunities for profit, they showed the English settlers of Barbados how to gain wealth by introducing sugar from Brazil, and taught other Englishmen in Virginia an easier way to grow tobacco by selling them their first Negro slaves, while for themselves they transplanted coffee from Mocha to their own plantations in Java.

In actually settling beyond the seas, they lagged behind the English during that half century. The spice islands were colonies of exploitation, where a handful of whites dominated large numbers of natives; they differed from colonies of settlement, with their transplanted European population and society, such as England established along the American Seaboard. Even in America, the Dutch settlements at New Amsterdam, Curaçao, Surinam, and the like were but sparsely settled trading posts from which they could exploit the neighboring colonies of other powers. Holland, of course, was a small country, and there were, besides, too many good opportunities at home for many Dutchmen to emulate the wholesale overseas migration of the English.

England chafed at a situation that allowed the profits of her own trade and the trade of her new Colonies to go across the North Sea to enrich the merchants of Amsterdam. For the time, however, she was too much distracted internally by political and religious disputes and too greatly outmatched at sea by the powerful Dutch navy to be able to hold her own in straight commercial competition, and could merely hope for a future day when London might replace Amsterdam as the world's entrepôt and when the red ensign of the English merchant marine might

lure away the lion's share of cargoes from Dutch bottoms. By the middle of the century, with internal opposition crushed and with a good navy developed at last, England was ready to challenge Dutch maritime supremacy. Her method would not be underbidding for cargoes and freights, but government regulation to restrict foreign competition; and she was prepared to back her program with armed force if necessary.

England's Navigation Acts

It was in such circumstances that Parliament in 1651 passed the celebrated Navigation Act, designed to liberate England's own trade, at least, from the Dutch stranglehold. Earlier centuries had seen similar parliamentary legislation, but it had not come to much. Now England was ready to enforce a definite commercial system based on the general principles of government regulation to promote the nation's economic well-being. England would not thoroughly discard this system until two centuries later, when she would be in a position to dispense with regulation and embrace a policy of *laissez-faire* or free trade. Like much else in English government and law, the Navigation Laws were subject to constant modification to meet specific situations; by the time that they were finally repealed in 1849, Parliament had passed some 340 other laws modifying the policy in detail. The most important of those changes came in 1660 and 1663; by that time the broad framework had been worked out by bringing the Colonies into the picture and defining their role in England's trade.¹

As far as the Colonies were concerned, three basic principles in the Navigation Acts limited their freedom of action. The first involved shipping. All trade to England from America, Asia, and Africa had to be carried in English (or Colonial) ships with crews at least three-fourths Englishmen (or Colonists). That barred from Colonial ports all foreign vessels, particularly those of the ever-present Dutch, who had been taking a heavy share of those lucrative long hauls.

Second, all Colonial imports, except wine and salt from southern Europe, had to come from England. One of the chief uses of colonies was conceived to be their function as an outlet for a mother country's manufactures; England, like most of the other colonizing powers, was reserving that market for herself by this regulation. If any products of other European nations were to reach the Colonies, they must at least come by way of England to swell the profits of the new London entrepôt.

Finally, the acts enumerated or listed certain Colonial products that could be shipped only to England. These were, for the most part, com-

¹ The Navigation Acts were fairly anonymous measures—not the work of Cromwell or any other person, but rather the combined work of numerous London merchants and officials.

modities that could not be produced in England itself and would, therefore, help to round out a self-sufficient empire that would depend as little as possible upon outsiders. Official opinion called for a favorable balance of trade, with an excess of exports over imports; consequently, the role of colonies, especially of those with a climate different from the homeland, was obvious in such a system of "sell more than you buy in foreign trade." All sugar, all tobacco, all indigo, and, as years passed, all of various other American products that were added to the "enumerated" list were allowed to be shipped only to England. If, as generally happened, a colony produced more than England herself could consume, the mother country could make a tidy entrepôt profit by re-exporting the surplus to European countries that were not blessed with a supply of their own. The Colonists, however, were denied the extra profits, which would have been theirs had they been permitted to ship their products directly to European ports where prices were higher than in England. On the other hand, many Colonial products, such as flour and fish, that would compete with England's own products and that she did not need, might be shipped anywhere, in order that the Colonists would be able to buy English wares in return.

Naturally, the interests of the Colonists were subordinated to those of England in such an arrangement. Had the Americans been free to buy and sell wherever they pleased around the world, they could certainly have made more money. There were, however, certain compensations, which have been too often overlooked in the general American condemnation of the system. The Colonists and their ships were granted the free run of the empire, virtually on a par with the English themselves—a privilege so valuable that Scotland voluntarily gave up its separate government in 1707 in order to secure it. And a look at the story of American commerce in the dreary decade following the Revolution shows the former Colonists appreciating, to their sorrow, what it meant to have to look at the British Empire from the cold outside.²

The Navigation Acts fell unevenly upon the Colonists as far as restrictions and privileges were concerned. The Southern Colonies, which, like the West Indian colonies, were regarded as the most desirable in English eyes, had more legitimate cause for grievance than did the Middle and Northern Colonies. Products of the latter appeared less frequently upon the "enumerated" list, and those Colonies were, therefore, freer to export to regions outside England, and they took full advantage of the shipping opportunities. Moreover, while the latter purchased from England almost exactly as much as the Southerners, they sent only a quarter as much to England in return. The balance of the Northern cargoes came from their bartering of cargoes in other ports. That is

² See Chapter 12.

evident from the following brief summary of what the customs ledgers had to tell of the trade with England herself:

COMMERCE OF AMERICAN CONTINENTAL COLONIES WITH ENGLAND*
(Annual Averages, in Thousands of Pounds Sterling)

	Exports to England			Imports from England		
	1701- 1710	1731- 1740	1761- 1770	1701- 1710	1731- 1740	1761- 1770
New England	37	64	113	86	197	358
New York	10	16	62	28	92	349
Pennsylvania	12	14	35	9	52	295
Maryland-Virginia ..	205	394	468	128	207	491
Carolinas	14	177	330	22	94	262
Georgia .....	..	...	36	..	3	40

The relative importance of the continental or mainland Colonies (they did not number 13 until 1733) in relation to British trade as a whole is shown in the second table, which indicates that, although constantly overshadowed by the British West Indies, their commerce was increasing at a faster rate than was any other part of British trade, just as England's trade with the empire (including Ireland at that time) was overtaking her commerce with the foreign nations of Europe:

ENGLISH COMBINED IMPORTS AND EXPORTS*
(Annual Averages, in Thousands of Pounds Sterling)

	1701- 1710	1731- 1740	1761- 1770
American continental	556	1,313	2,843
British West Indies	942	1,781	3,406
India	582	1,179	2,516
Ireland	579	1,045	2,850
Total Empire	2,802	5,751	12,651
Total Europe	7,673	10,555	11,740
Grand Total	11,069	18,919	25,930

From the English standpoint, none of the continental colonies could compare with the Caribbean sugar islands—Jamaica, Barbados, Antigua, St. Kitts, and others. Those islands concentrated upon a single activity, the raising of cane from which came sugar with its by-products of rum and molasses. Furnishing England with her most important "enumerated article," sugar, they were able in return to purchase large quantities of English offerings. On the eve of the Revolution, the commerce of Jamaica alone totaled more than that of all the continental colonies combined. That direct trade is not of immediate concern here, but those sugar islands, as will be seen, helped to fit into the picture of imperial

* Compiled from D. Macpherson, *Annals of Commerce, passim*; American figures tabulated in J. S. Homans, *Historical and Statistical Account of the Foreign Commerce of the United States* (1857), pp. 6-7.

self-sufficiency through their heavy purchases from the Middle and Northern Colonies.

The Southern Colonies

On the mainland, the closest counterpart to the islands, from the standpoint of imperial desirability, was the Chesapeake region with its tobacco. The initial shipment of that "noxious weed" made by John Rolfe from Jamestown in 1614 was the beginning of America's most important Colonial offering. At first, the Dutch carried off a considerable part of the supply, but England was quick to "enumerate" it, and thus she forced all tobacco to London, Bristol, or some other English port. The English, to be sure, could not smoke all that Virginia and Maryland produced. In 1773-1775, their annual tobacco imports averaged 99,000,000 pounds and their re-exports 83,000,000 pounds, supplying a heavy entrepôt profit as a result of the monopoly.³ Tobacco could be raised in southern England, but that was discouraged by the government, which wanted the customs duties on the American product.

The Colonial planter was generally content with what he made in raising the crop; the further profits of distribution he left to others. He ordinarily consigned his tobacco to some London merchant and ordered whatever imports he wanted in return. Factors or commission agents, generally Scots, resided in the Colonies to handle the business for the English merchants. Frequently, the planter's purchases outweighed his sales, so that his account was in arrears, but heavy interest charges made even his debt profitable to the merchant, and only in extreme cases would a local Scot foreclose. The same situation was repeated with the cotton planters in the early nineteenth century, when New York houses, with Connecticut Yankees resident in the South as factors, carried on much the same sort of business, making such heavy profits in interest, commission charges, freight, insurance, and other tolls that it was claimed that they got 40 cents of every dollar the planter received for his cotton. Such a state of affairs, comparable to the condition of the English wool trade in the early Middle Ages, could be called a passive commercial economy in contrast to the active economy practiced in New England.

Another unique feature of the Chesapeake trade was the absence of commercial centralization such as existed in the busy ports to the northward. Norfolk carried on a modest amount of business and was the chief habitat of the Scottish factors, but much of the trading took place locally throughout the region. A ship or brig, generally English but sometimes from New England, would poke its way up the James, York, Rappahannock, Potomac, or some other arm of the sea to a little planta-

³ *Massachusetts Historical Society Proceedings*, Vol. 44, p. 369.

tion wharf, unload the desired imports, and take on the big tobacco hogsheads. It was not until the Revolution that Baltimore, at the upper end of the bay, began to gather that loose trade into its hands and to develop the flour trade, which was gradually overtaking tobacco in importance.

Further to the southward, Charleston was doing a better job in concentrating the trade of the region in a single port. Established long after the Chesapeake trade was well under way, it took a while to gain momentum; but by the middle of the eighteenth century, Charleston was doing a flourishing business. It felt the impact of "enumeration" from the outset, for indigo, valuable for blue dyes, was on the original list, while rice, which was successfully transplanted to the adjacent swamp land, was also "enumerated" for a considerable period. The third offering of South Carolina, deerskins obtained in trade with the Indians, escaped such restrictions until the end. North Carolina, cut off from the open sea by the long sand spit culminating in Cape Hatteras, and approachable only by a few dangerous inlets, lagged far behind its proud neighbors to the north and south. Its only important export consisted of naval stores (whence the nickname "Tarheels"), and those too were added to the "enumerated" list early in the eighteenth century. Georgia, the last of the Thirteen Colonies to be established, had developed only a very modest trade by the time of the Revolution, with Savannah serving as a small-scale counterpart of Charleston. It should be remembered that the cotton "enumerated" by the English came from the Caribbean at that time—in fact, it was not produced by any Southern states until after the Revolution.

While the South was caught by "enumeration" at almost every turn, and thus restricted in its choice of markets, it was able to make money because England wanted what it had. Under such conditions, it was possible to develop a shuttle trade. A vessel might profitably spend all its time sailing back and forth between London and the Chesapeake or between Bristol and Charleston because of the availability of cargoes at each end of the route that could be sold at the other.

"Triangles"

Farther northward, the situation was different. The Middle and New England Colonists also wanted English textiles, hardware, and other manufactures, but England had small use for what they could send in exchange. Consequently they had to use their ingenuity to find other markets for the nonenumerated produce for enough money to enable them to get what they wanted from England. As a result, instead of a simple shuttle trade, the vessels from those colonies prowled around on all sorts of mongrel voyages, trading and retrading until they eventually got what they desired. Out of this practice of following

lines of barter came several triangular patterns, among others too complex for any such geometrical description. Each region had its own particular staple products—flour from the Middle Colonies; livestock from Connecticut; fish, lumber, and ships from eastern New England. With such products as a start; those mariners ranged far and wide until they came back with legal ladings from England, together perhaps with illicit cargoes from no one knew where—the customs officials discreetly forebore to inquire too closely.

The principal outlet for these products of the Northern Colonies was found in the English sugar islands in the West Indies. The concentration of those islands upon sugar made them a good place in which to exchange such goods. Jamaica had—in addition to sugar—coffee, pimento (pepper), and other semitropical commodities; she also carried on enough irregular trade with the Spanish colonies to provide a supply of silver dollars. Luckily for the Yankee traders, the planters found it more profitable to buy their flour, fish, and lumber from the “continent” than to spend the time of their slaves in producing such necessities themselves. Out of that situation grew the sugar triangle, which became one of the mainstays of Colonial commerce. This triangle involved three-cornered reciprocal support within the empire, with the mainland colonies, the sugar islands, and the mother country each offering something of value and each receiving something in return. The mainland colonies found a market for products that England herself did not want; the islands were free to concentrate upon raising cane; and England could receive payment for her manufactures, which otherwise the Americans might not have been able to purchase. The triangular trade did not assume a single, standardized pattern. Sometimes a fair-sized brig or ship might carry a cargo from Philadelphia, New York, or Boston, swap it at Jamaica or Barbados for sugar and molasses, and proceed on the long haul to London or Bristol, returning home with English wares, unless the vessel itself was sold there. At other times, small schooners or sloops would carry cargoes to the Caribbean and return to their Colonial home port, whence the surplus sugar might be carried across the Atlantic in larger vessels. But those two alternative patterns by no means exhausted the possibilities: tramp voyages of various sorts, with frequent “swapping” and “re-swapping,” were common.

It did not take the Colonists long to discover that the English islands were not the only ones that would take their offerings in exchange for sugar. A skipper might arrive at Jamaica or Barbados to discover that previous arrivals from the northward had so glutted the market that his cargo could be sold only at a loss, especially since in those days of slow communication every voyage was, of course, literally a venture. Rather than sell within the empire at a sacrifice, he might slip over to Martinique, Guadeloupe, Haiti, or some other foreign island and sell his

wares at a substantial profit, for none of the other nations had such good supply sources. This practice, however, ran counter to the English plans for a self-sufficient empire. To check it, Parliament in 1733 passed the Molasses Act, which imposed a very heavy duty upon sugar from the non-English islands. Effectively enforced, it might have curbed such wanderings outside the imperial fold, but complaisant customs officials winked at it for years. In 1750, more tonnage arrived at New York from the foreign islands than from the English ones. Finally, in 1764, the new Sugar Act lowered the duty on foreign sugar and molasses, but put more teeth into the collection, to the anger of the Yankee traders, who had violated the old regulation so long that they felt the new one was an infringement of their vested rights.

The Navigation Laws, however, did permit a moderate amount of trade outside the empire. Nonenumerated commodities might be shipped to Spain and Portugal and their Atlantic islands near by. Catholic restrictions on meat meant a good market for fish in those regions. Staves and headings for wine casks also found customers, and so, too, did flour. Consequently, trade with the Straits (of Gibraltar) flourished. Most of the money received from such transactions had to be spent in purchasing return cargoes from England, but exceptions were made in the case of salt, especially from the Portuguese Cape Verdes, and of wine, from Madeira in particular, which could be brought home directly without paying toll to the English entrepôt. Legal trade with Europe north of Spain, however, was extremely rare. France, Holland, Germany, and Scandinavia would have been glad to receive tobacco and other "enumerated" articles direct, but had scant use for the rest of the Colonial exports.

A third branch of trade that did not show on the English import and export list was the exchanging of commodities up and down the coast among the various Colonies. In particular, eastern New England presented a constant market for flour from the Hudson, the Delaware, or the Chesapeake, to which it sent its fish and lumber in return. Sometimes, more ambitious coastal traders saw that Eastern produce reached Carolina, while occasional vessels ventured northward to the Maritimes, Quebec, or Newfoundland. Now and then, a port developed local entrepôt functions of its own. It would distribute English imports up and down the coast, and receive in return materials that could be shipped back across the Atlantic. Early in the eighteenth century much of New York's commerce and financial transactions with England were routed for a while by way of Boston, which took the profits inherent in such an arrangement.⁴

⁴ Invaluable source material, illustrating the complexities of these Colonial routes and cargoes, is contained in the details of thousands of voyages in the mid-eighteenth century, from the records of the custom house "Naval Officers" at various American and West Indian ports, assembled by Professor L. A. Harper of the University of California.

Altogether, it is easy to appreciate the discrepancy between exports and imports in the trade of the Middle and Northern Colonies with England. Between trade with the sugar islands, trips to the "Straits," the coasting trade, and occasional less conventional voyages, they disposed of enough of their unenumerated goods to pay for what they wanted from London or Bristol. But, while most of the voyages from Pennsylvania up to Maine followed those general patterns, the initial cargoes varied widely among the different regions.

Trade of the Middle Colonies

The flour barrel was the chief symbol of the trade of the Middle Colonies—New York, New Jersey, and Pennsylvania (Delaware was often reckoned as the "three lower counties" of that third Colony). Scores of little mills throughout the hinterland ground their wheat into flour, or their corn into meal, to be carted or floated to New York or Philadelphia; although New Jersey produced its fair share, most of its seaborne trade went through the big ports just across the Hudson or the Delaware. Flour was seldom needed in England, which was still relatively self-sufficient in agriculture, but it found a constant market in the Caribbean and a fair demand in southern Europe. The casks of salted beef or pork, also offered in generous quantities by the Middle Colonies, competed with the Irish product. Ireland, with its linen industry, absorbed a fair amount of Colonial flaxseed, while one of the few products marketable in England were the potashes and pearlashes (used in the making of soap and glass) which came from the burning of logs incidental to clearing away forests. Like most of the other Colonies up and down the coast, those in the middle region shipped modest amounts of furs obtained from trading with the Indians. Since the trade of a port depended somewhat upon the hinterland that it served, Philadelphia profited by the rapid growth of Pennsylvania with its liberal land policy. Its commerce took a sudden jump in 1749, and although New York was ahead in the 1760's, Philadelphia was clearly in the lead by the time of the Revolution and maintained that position for the next 20 years.⁵

The Middle Colonies were less desirable members of a self-sufficient empire than were the tobacco and sugar regions; they found, nevertheless, more favor in English eyes than did New England, which was called by one writer in 1695 the "most prejudicial" part of England's possessions. Instead of filling a "passive" commercial role allowing a maximum of profit for British merchants and shipowners, the New Englanders developed a decidedly "active" commerce that frequently competed with that of the mother country. They declined, as will be noted later, to develop a product that would have contributed to the em-

⁵ Tables indicating the commerce of the principal ports around 1770 are included in the Appendix of V. D. Harrington, *The New York Merchant on the Eve of the Revolution*. New York: Columbia University Press, 1935.

pire's self-sufficiency. On the other hand, they persisted in manufacturing to meet their own needs instead of buying manufactures from England. They profited more than any other Colonists by the provisions of the Navigation Laws, and at the same time they probably evaded those laws more persistently than any other Colonists. Altogether, their commerce paid them well, and contributed to the prosperity of numerous thriving ports.

The commerce of southern New England was not impressive in its volume, but it developed two specialties. The distinctive offering of the Connecticut ports was livestock: for more than a century, deckloads of horses and cattle, along with miscellaneous agricultural produce, were carried from New Haven and New London to the sugar islands and other parts of the Caribbean. Newport handled another type of livestock—slaves from the Guinea Coast. These were taken to the sugar islands and traded there for molasses, which, in turn, was converted into rum, to be exchanged for more Negroes. This business was the profitable innovation of Rhode Island in triangular trade.

New England Cod and Pine

It was the territory north of Cape Cod, however, which could claim the most active commercial region of the Colonial period. Boston clearly led all other American ports during the first century after settlement, although the 100-mile stretch eastward up to Portland (then called Falmouth) also participated in a lively manner. The climate of northern New England was too bleak for the effective use of Negro slaves, and its farms were often more prolific in stones than in crops, so that the produce of the Southern or Middle Colonies could not easily be duplicated. By hard labor, however, profitable initial shipments could be wrested, with small capital investment, from the fishing banks and the pine forests. With those as a start, the Yankees wandered far and wide, swapping and re-swapping until they came back with generous profits.

It is very appropriate that the "sacred cod" hangs in the legislative halls at Boston, for, like the woolsack on which the Chancellor sits when presiding over the House of Lords, it represents the original economic foundation of the region's prosperity. Geography gave New England an advantage over old England, as far as the fisheries were concerned. Ever since the Cabots discovered the Grand Banks south of Newfoundland teeming with codfish, hardy mariners from the western ports of England had gone out there for the fishing season. The distance was too far, however, for them to return home with every fresh catch of fish, and, consequently, they had to go ashore on Newfoundland to salt and dry their fish, which they would eventually carry home at the end of the season. The fishermen of Marblehead,

however, could easily return with each haul during the season to their home port, where the fish could be split and dried while the fishermen were off for another load. Massachusetts fishermen did not always have to go as far as the Grand Banks, for the Georges Bank not far off their own coast often yielded rich hauls. The finished products of this strenuous work were frequently divided into three grades. The best was reserved for local consumption or traded down the coast in exchange for flour or tobacco. The next best was carried over to the Catholics of southern Europe in return for salt and wine. Finally, the "refuse" was shipped to the sugar islands to feed the slaves. This business often ran afoul of the French in those regions, and in the many years of war French privateers were wont to prey upon the Yankee fishermen. This was one reason why New Englanders participated eagerly in the capture of Louisburg in 1745.

If fishing was the specialty of eastern Massachusetts, lumbering was the prime activity of the narrow strip of New Hampshire coast and the long, indented coast of Maine, then part of Massachusetts. Portsmouth was the lower limit of the great belt of virgin white pines, trees often reaching a tremendous size, with a texture so soft that they were sometimes called "pumpkin pine." Scarcely had settlements spread into the southern part of that region, when primitive little sawmills began to convert the huge logs into timber, planking, and boards, while the settlers during spare hours split the wood into shingles and clapboards. The tougher white oak of the region was likewise converted into staves and headings for sugar and wine casks. There was a steady demand for these Eastern forest products in the Caribbean, while the staves also found a market in Madeira and the other wine islands. Yankee ingenuity anticipated the modern prefabricated house by sending whole ready-to-assemble house frames to the West Indies. Although England was experiencing an ever-increasing shortage of timber, it drew only a moderate amount from New England, depending more generally upon the nearer Baltic supply.

In one particular product of these pine forests, however, England had a very keen interest. None of the great maritime powers of that day—England, France, Spain, or Holland—produced within their borders any trees suitable to serve as great masts for their warships. Along with tar, pitch, and other "naval stores," masts were almost the only "strategic materials" for war that were not obtainable at home in that relatively self-sufficient era. The Baltic supplied medium-sized firs that could be pieced together to form masts for ships-of-the-line, but the New England forests produced great, pliant single sticks even up to the maximum mast-size of 40 yards long and 40 inches in diameter. From 1652, when the first Dutch war threatened the Baltic supply, until 1775, when the news of Lexington led the Colonists to break off

the trade, the Royal Navy received all its great masts from Portsmouth, New Hampshire, and, after 1727, from Portland. The comings and goings of the "mast ships" were the principal maritime events at those Eastern ports. To preserve those great trees for the navy, Parliament reserved all pines over two feet in diameter and instructed royal forest officials to cut the "broad arrow" upon them, but the Colonial lumbermen time and again disregarded those regulations that would have deprived them of much good potential lumber. Masts and naval stores were "enumerated" shortly after 1700, but that legislation did not prevent the Colonists from selling them to France and Spain, even while those nations were at war with England.⁶

While the masts went regularly to the naval dockyards across the Atlantic, the New Englanders showed little interest in producing naval stores, which would have given them a very useful niche in the scheme of a self-sufficient empire. From those pines could have been extracted tar for preserving ropes and pitch for calking seams in hulls. England required large amounts of both tar and pitch, and made heavy annual purchases from Sweden and other Baltic nations. Around 1700, the government realized that this Baltic dependence was bad, both from a political point of view and with respect to strategic considerations: that it led to an "unfavorable balance" of trade with the Baltic, while the bottleneck entrance to that sea meant that an enemy might cut off those essential supplies as England herself was cutting off the supplies of her rivals. Here was an obvious opportunity for "prejudicial" New England to play a useful role in remedying both those evils. Parliament offered a bounty on naval stores and sent over an agent to stimulate their production, but its representative found that the Yankees would rather spend their time spinning and weaving home-spun woollens, to the detriment of the English export trade. Only in North Carolina did the naval-stores business gain any headway, but the Royal Navy rejected its output as of "too hot a nature" and injurious to the ropes—a thought which arouses added sympathy for the poor devils who were from time to time tarred and feathered.

Colonial Shipbuilding and Shipping

Perhaps the most profitable product of those Yankee pines and oaks went out in the form of ready-made vessels which could be produced in almost any harbor or tidal creek. The abundant supply of timber close at hand made Colonial construction far cheaper than construction in England, which was running short of oak and lacked domestic masts. In addition, any vessel built on Boston Bay or along the Merrimac or Kennebec was rated under the Navigation Laws as virtually

⁶ R. G. Albion, *Forests and Sea Power: the Timber Problem of the Royal Navy*, Chapters V-VI. Cambridge, Mass.: Harvard University Press, 1926.

English, just as if it had been built on the Thames: it had the free run of the empire (except India), and it could be sold in England. By the time of the Revolution, about a third of all the shipping in British registry had been built in the American Colonies, mainly in eastern New England. English merchants were usually glad to snap them up as bargains, for they were cheaper than those built at home. The privileged position of Colonial shipping meant that in one respect, at least, the Navigation Laws were an asset rather than a liability to Colonial commerce.

Those Colonial vessels fell into two main categories. The larger, "square-rigged" ships and brigs sometimes ran as large as 500 tons and were capable of transatlantic voyages. The smaller schooners and sloops were generally used for coastal, fishing, and West Indian trips. Unlike other types, which followed English models to a considerable extent, the schooner was a distinctive American invention. Its fore-and-aft rig required fewer men to handle than the square rig of the brig, which likewise had two masts, and it was also better for keeping off a lee shore—an important consideration in the coasting trade. In 1771, the Colonies produced 128 square-rigged vessels and 291 schooners and sloops, totaling 24,068 tons.

From the very beginning, the New England vessels began to undertake "tramp" voyages which showed a considerable amount of ingenuity and imagination, quite different from the "passive" shuttle trade of the Chesapeake region, which was largely in English hands. The 200-ton ship *Tryal*, for instance, built in Boston in 1642, made her first voyage to the Canaries and then to the sugar islands of St. Kitts and Barbados, on her next trip the long haul to Malaga and Bilbao in Spain, then journeyed up the coast to Canada, and in 1645 sailed to London and Holland, for the Navigation Laws had not yet restricted the legal scope of such activity. Whereas the business in the Chesapeake fell pretty much into the hands of factors from the English houses, the merchants of Boston, in particular, and later those of New York, Philadelphia, and other ports kept most of the initiative in their own hands. Generally, they owned both the vessels and the cargoes that they carried, and developed regular commercial contacts with "correspondents" along many of the principal sea lanes. Such an arrangement naturally was less desirable to the English than the more "passive" commercial role of the Colonies to the southward. The New Englanders preferred to keep the commissions, freight money, and other profits in their own hands; but at least these activities of the Middle and Northern Colonies enabled them to buy as heavily from England as did the Southerners with their "enumerated" goods.⁷

Commercial relations between the Colonies and the mother country

⁷ Detailed analysis of these methods will be found in Harrington, *The New York Merchant on the Eve of the Revolution*.

ran a fairly placid course, without too much interference with irregularities, until the close of the Seven Years' War in 1763. Then George Grenville, Chancellor of the Exchequer, worried by the sudden jump in the national debt, began to tighten up some of the former leakage that had proved so profitable to the Colonial traders. The new Sugar Act, the increased vigilance of customs officials, and an extension of the "enumerated" list to include many new articles coincided with the Stamp Act to provoke widespread opposition in the Colonial ports. The Colonists were quick to play their highest commercial trump in return: they refused to import from England, and thus cut off an important share of the mother country's markets. This blow fell particularly upon the British merchants, heavily interested in the American trade.

This nonimportation agreement, as was anticipated, produced enough pressure in Parliament to result in the repeal of the Stamp Act within the year. The Colonial merchants co-operated in nonimportation, but most of them were reluctant to follow the radicals toward further steps that would jeopardize the constantly growing commerce among various parts of the empire.⁸ The trade statistics, which suddenly became more ample with the increased customs activity, showed a fairly steady increase until the eve of the Revolution, when the Continental Congress declared its economic independence of the imperial bond months before it declared political independence. Even in 1775, when fighting had actually started around Boston, and a new nonimportation agreement cut off shipments from Britain once again, exports were permitted for several months longer; this produced the heaviest total of cargoes to England in the course of the whole Colonial period. Eight years later, after independence had been won and recognized, the Americans suddenly began to realize that membership in the British Empire had its economic advantages as well as its burdens. But their adjustment to the new problems of independence is another story.

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CHAPTER 5

Westward Expansion Before the Homestead Act

The Importance of the Westward Movement

THE MOVEMENT OF THE PEOPLE from the Eastern Seaboard to the Pacific Coast is of tremendous significance to the student of American economic history and provides one of the keys for an adequate understanding of why American institutions resemble and yet are different from the European institutions whence they originated. This great movement, involving millions of persons and spanning nearly three centuries of time (1607-1890), contains all the drama, comedy, and tragedy, that one would expect in a play so sweeping in scope and with a theme of such grandeur. But more important than this, it provides answers to some of the perplexing questions as to how and why adjustments were made, and finally, how Americans conquered the wilderness and set in motion those forces that are dominant in our economic life today.

Imagine an observer perched high above the center of the Mississippi Valley and possessed of telescopic eyes watching this scene, of such great interest and importance, unfold itself before his gaze. Against a background of green, inhabited only by the Indians, wild animals, and other denizens of the forest, a thin trickle of hunters, traders, and pioneers wend their way westward. Soon they are followed by missionaries; then a fringe of settlement appears, followed by the farmer, the introduction of capital, manufacturing and industry, banking, and the other orderly institutions of our own day and age. The scene is repeated again and again, beginning in the Tidewater area of Virginia and extending ever westward until the Mississippi is crossed, until the area of the Great Plains is traversed, and until the Pacific Coast is peopled. It is not always orderly: sometimes civil war intervenes; sometimes the red man makes a vain attempt to halt the inexorable progress of the westward march; and sometimes the marchers literally run in their search for land or gold. But the continual recurrence of the drama is one of the most American things in all American history.

Types of Frontiers

The frontier, or the area where the actual pioneering process took place, may be defined in a number of ways: as a point behind which were cities, culture, and civilization and ahead of which were forests,

Indians, and wild animals; or as a "line marking the fringe of white settlements that was constantly moving westward."¹ But more than this, the frontier was an area in which the settler had to readjust himself to primitive conditions, where he had to test old institutions, and if these failed, as they did in the area of the Great Plains, he had to invent new ones that would stand up under a different or altered environment. Only an optimist would venture to the frontier; thus it was a selective process that left its indelible stamp; indeed, even today the Westerner exhibits that typical "breeziness" or optimism customarily associated with the frontier mind and character.

At least three different types of frontiers have been developed by the American people in their long westward trek. Underlying all of these types, and fundamental to them, was the system of land tenure, the manner by which a person occupied or received title to the land he settled or claimed. Where the land grants were rigid and in small lots, the type of settlement that prevailed was far different from that where they were granted loosely and in large amounts.

The first type of frontier was found in New England during the Colonial period and was based on free labor. By the New England method, the land was nearly always granted in towns—plots 6, 8, or 10 miles square—to a group of owners called the "proprietors," who received their grant from the governing body of the Colony, usually the General Court. Beginning as early as 1635 a group of proprietors founded a frontier settlement away from the coast, and soon the rich Connecticut Valley was occupied. Such grants were ordinarily laid out in the form of a square, with a knot of settlement in the center for protection and the larger cultivated fields running from the commons out to the edge of the grant. In general the plots allotted to each person were few in number and restricted in acreage. The original proprietors often sold part of their grant to new settlers, but sometimes sold all of their land and moved on to greener pastures. Indeed, getting the grant and then selling it at an enhanced figure was one of the methods used to populate the land. Although this type of settlement encouraged the democratic process at first, later on the original proprietors claimed the exclusive right to vote on all matters affecting the town or township, and this resulted in considerable friction between the newcomers and the original inhabitants. Then, too, the proprietors as well as the central governing body tended to force their ideas of religious observance upon the newcomers.

A second type of frontier settlement, found mainly in the Southern Colonies, involved relatively large grants of land, sometimes running into thousands of acres—indeed, in a few cases, to hundreds of thousands of

¹ Dan E. Clark, *The West in American History*, pp. 80-81. New York: Thomas Y. Crowell Company, 1937.

acres. Here during Colonial times the plantation economy had its beginning, producing tobacco, rice, and indigo, and employing slave labor. Because of poor and wasteful agricultural practices, the land was soon exhausted, and it was often cheaper to move plantation and all to a more westerly area and begin anew than it was to try to build up the depleted soil. The land was usually granted in a careless fashion, sometimes incorrectly surveyed, and this made for the establishment of counties rather than towns, thus contrasting with New England. The southern frontier was, in general, based on a relatively large area of land, and often involved the use of slave labor.

A third type of frontier, by far the most important, contained the largest area of settlement and was settled by the "little fellow"—the poor immigrant or settler who staked his life against a nominal area of free or nearly free land. In this type, which was found in all of the Colonial regions, one, two, or a score of families from the lower middle class migrated to the frontier, built caves, "lean-tos," or cabins, and began the serious and laborious task of wresting a living from forests and fields. Soon these pioneers were followed by more systematic farmers, by blockhouses, and by knots of settlement. In most cases the pioneer went to the frontier for economic betterment, attracted by the cheap land that provided the opportunity; while in other instances he was pushed out by the economic and legal pressure exerted by the great landowners, particularly in New York and in the Southern Colonies. This type of frontier had no rigid pattern, was ubiquitous in extent, and, in most cases, constituted the real "cutting edge" of the westward movement. It was found in New England in the seventeenth century, in New York at the same time, in Pennsylvania from almost the earliest settlement, in the area above the "Fall Line," in the Southern Colonies, in the Old Northwest Territory, and finally in the great area west of the Mississippi River. Sometimes the specific pattern of settlement varied to meet local conditions, but, in general, the picture was the same. In this type of frontier settlement, democracy was real, vital, and was continually kept alive as the process repeated itself over and over again.

Stages and Areas of the Westward Movement

Almost from the earliest settlements a certain rather clearly marked sequence in the westward movement is discernible. First came the hunter, then the fur trapper, the trader, and the missionary. Such men as Marquette and Joliet, Daniel Boone, Jedediah Smith, Jim Bridger, Jason Lee, and Father De Smet roamed over the West, many times in advance of actual settlement, and the accounts of their travels often provided the information that guided the actual settlers to their destination on the frontier. The activities of men of this class led to the

founding of fur-trading posts such as Albany, Pittsburgh, and many other places that later developed into important cities. Closely following the trails blazed by these wanderers came the ranchers, or the pioneers who planted a patch or two of grain or vegetables in the wilderness and among the stumps, bore the brunt of Indian attacks (and often fomented them as well), and laid the basis for the coming of the next group of settlers—the farmers. The farmers often bought out the ranchers or the professional pioneers for a few dollars, settled down on the partially cleared land, improved it, and began the orderly processes of living and building a more permanent civilization. With them came more capital for the development of the natural resources, and soon gristmills appeared, attracting skilled workmen; towns sprang up and presently industries and cities. This sequence in the subduing and development of the wilderness appeared again and again, and this pattern has left its indelible imprint on American habits, thought, culture, and institutions. It was this constant recurrence that made for the difference between American and European life—and underlying it was the rich, relatively free land. Sometimes there were local variations from the usual pattern of settlement, such as a gold rush, when within a few weeks all of the groups seem to have arrived at about the same time.

The areas in which the westward movement took place are fairly well defined and can be traced chronologically. For the first century and a half, the chief area of settlement stretched from Maine down to Georgia, and extended from the Atlantic Coast inland to the Appalachian Mountains. Culturally as well as economically, this area was divided into two parts; the first part was the Tidewater region, inhabited mainly by people controlling large land grants, aristocratic in bearing, and looking to England and Europe for guidance and commercial connections; the second part, above the Fall Line in the Piedmont area, was populated with frontiersmen or backwoodsmen who possessed relatively small land plots, were democratic in outlook and action, and looked to themselves for guidance, but who were nevertheless ruled by and somewhat dependent on the Tidewater area for capital, goods, and services. Naturally, conflicts soon arose between the peoples of the two areas.

In the last quarter of the eighteenth century, a second area stretching from the Appalachians to the Ohio River and westward to the Mississippi was being settled. It was peopled mainly by pioneers of diverse nationalities, and its settlement was patterned after the third type of frontier. From it were carved the states of Kentucky, Tennessee, and, later, West Virginia.

A few years later, and following the same general scheme, came the settlement of the area of the Old Northwest, comprising the states of Ohio, Indiana, Illinois, Michigan, and Wisconsin. This region was peopled by typical pioneers, and settlement followed the same sequence

and developed in much the same way, so far as the natural resources permitted, as the second area. At first the occupants were mainly pioneers pushed out of the South by the pressure of the large landowners, but by the middle of the nineteenth century New Englanders and pioneers from the Middle Colonies helped to swell the numbers inhabiting the region.

Early in the nineteenth century, explorers, fur traders, trappers, attracted by the profits of the fur trade, and missionaries roamed over the rich area lying west of the Mississippi River. Here new and terrifying problems arose to plague the settlers, accustomed to moist land, to water and timber; for the farther west they went, the dryer and more open the region became, until, when a point west of the 98th meridian was reached, but one factor was left—the land. Here, too, were the fiercest and most warlike of all Indians, perhaps the world's best horsemen, who successfully defied the white man for many years. Furs, grains, minerals, and beef each played a role in the settlement of this vast plain that stretched from the Mississippi westward to the Rocky Mountains and from the Rio Grande northward to the Lake of the Woods.

Finally, there remained the region of the Pacific Coast, extending from the ocean eastward for a thousand miles to the watershed of the Rocky Mountains. Furs, rich farm land, gold, grain, timber, and fish have all contributed to the economic and historical development of this rich area. In point of time, many settlers crossed the region of the Great Plains and settled on the Pacific Coast before the Middle West was filled up, and hence the development of the two regions took place at about the same time, roughly from 1830 onward.

The Routes of Westward Travel

From ancient times man has used rivers as means of ingress and egress to continents, and the New World proved no exception. The French and the Spanish, the former to the north and the latter to the south of the English settlements, utilized the rivers as highways in their advance into the interior of the country. The St. Lawrence led to the Great Lakes, which constituted in effect a great inland sea; this route was early used by the French, beginning with Champlain, who early in the seventeenth century ascended this great waterway and discovered Lakes Huron and Ontario as well as Lake Champlain. Easy portages connected Lake Superior with the St. Croix River; Lake Michigan was connected *via* Green Bay and the Fox River with the Wisconsin River, *via* the Calumet (near Chicago) and the Des Plaines with the Illinois River, and *via* the St. Joseph River on the eastern end of Lake Michigan and the Kankakee with the Illinois River. From Lake Erie short portages led from the Maumee to either the Wabash or the Miami,

from the Sandusky to the headwaters of the Scioto and down that stream to the Ohio, from the Cuyahoga to the Muskingum or from French Creek to the Allegheny; another route led *via* Lake Chataqua. These easy paths permitted the French to establish themselves on the upper Mississippi long before their English antagonists entered this rich land of peltry.

The English, too, used the rivers as a convenient and cheap means of transportation, beginning as early as 1627, when James Claiborne of Jamestown pushed up the Potomac and the Susquehanna Rivers in search of fur. The Dutch in New York had established themselves up the Hudson as far as Albany by 1623, and by 1661 had a post at the rapids of the Mohawk, the site of present-day Schenectady. In New England the story was much the same: Springfield on the Connecticut was established by 1636. From the Hudson *via* Lake George, Lake Champlain, and the Richelieu River was the usual route to Canada. The East was connected with the Ohio Valley by means of short portages between the Susquehanna and Allegheny Rivers near Kittanning, between the Juniata and the Allegheny, and from the Potomac to the Monongahela by way of Wills Creek. Lake Ontario could be reached from the upper Mohawk by way of a portage to Oneida Lake and then down its outlet to the present Oswego, or by portaging to the headwaters of Black River and going down that stream to connect with the Lake and the St. Lawrence and Canada.

There were land or land-and-water routes that led through the great Appalachian barrier, some of which were early used by the Americans in their westward journeys. The best route, up the Hudson and the Mohawk and thence to the Susquehanna or to Lake Erie, could not be used until the late eighteenth century because the powerful and warlike Iroquois blocked the path. The second led from the Mohawk to the Allegheny, while the third led across southern Pennsylvania by a western branch of the Susquehanna and over a long land trail to the Allegheny; another route made use of the westward-reaching Juniata and then the upper Conemaugh and the Ohio. The route later known as the Forbes Road led through southern Pennsylvania and became in time one of the most important of the Appalachian crossings. But the most important of all the routes led southward down the Great Valley to what is now the extreme western tip of Virginia and there crossed the divide by means of the famous Cumberland Gap. The route south of the great Appalachian barrier was blocked by the Cherokee Indians. Present-day railroads have utilized many of these routes, thus testifying to the soundness of the pioneers' engineering approach. Although these routes were long known to the early fur traders, they were but little used until near the end of the eighteenth century, when the settlers began to push

across the mountains in great numbers to the new, rich lands of Kentucky and Tennessee and later to the Old Northwest Territory north of the Ohio River.

Red Man and War Whoop

According to a recent estimate, at the time the white man settled in the area now within the confines of the present United States, there were about three million Indians. Generally speaking, those east of the Mississippi engaged in hunting, fishing, and simple agriculture, and the Six Nations or Iroquois in western New York had achieved the highest form of tribal and intertribal government. The Five Civilized Tribes to the southwest had also advanced to a fairly high state of civilization. West of the Mississippi the Indians of the Great Plains, owing to the introduction of Spanish horses from the sixteenth century onward, had become nomadic and warlike indeed. Apparently the principal reason for the relatively low degree of culture and civilization achieved by the Indians was that they had, before the coming of the white man, no draft animal larger than the dog.

Along the Eastern Seaboard, from north to south, the principal tribes were the Abnakis, Mohegans, Wampanoags, Pequots, and Wappingers in New England; the Delawares, Susquehannocks, and Iroquois (Mohawks, Oneidas, Onondagas, Cayugas, Senecas, and Tuscaroras) in the Middle Colonies; the Powhatans and Five Civilized Tribes (Cherokees, Creeks, Choctaws, Chickasaws, and Seminoles) in the Southern Colonies. Usually the tribes were at peace with each other, but "a life for a life and a tooth for a tooth," which was the basic judicial concept, made for war at various times.

Three courses of action were followed by the white man to solve the Indian problem. The first, employed by the French, was to intermarry with the red men and to carry on trade with them; the second, used by the Spanish, was to enserf and enslave the Indians, thus keeping them as a source of labor on the great Spanish land grants; the third, based largely on the wish of the English to occupy and cultivate the land, was mostly a policy of annihilation. "There is much truth in the old saw, that the early colonists first of all fell on their knees and then fell on the aborigines. Equally true is the saying that the colonist approached the native with a deed of sale for land in one hand, which the native was voluntarily to sign; while in the other hand and under the arm, were a Bible, a bottle of rum, and a gun."² Each new group on the frontier believed and practiced the same adage: "The only good Indian is a dead Indian." As the frontier was pushed farther and farther westward, the older areas, forgetting their own experiences and deeds, looked

² William C. MacLeod, *The American Indian Frontier*, page vii. New York: Alfred A. Knopf, 1928.

upon the Indian problem with kinder and more tolerant eyes, but to the frontiersman the Indian was a menace to be eradicated as soon as possible.

In a series of wars starting first in Virginia in 1622, the Indians were surely but slowly pushed back or eradicated along the Eastern Seaboard. Half a century later in King Philip's War, 1675-1676, one-sixteenth of the male population of New England lost their lives and most of the Indians in that area were crushed, although the remainder allied themselves with the French north and east of the Maine frontier. The New England attitude toward the Indians is well illustrated by the fact that Connecticut in 1704 offered bounties for scalps. Massachusetts was more refined; she "offered bounties for scalps graduated according as scalps offered were those of men, women, or youths."³ The brightest spot in this dark picture was the action of William Penn and his Quakers, who, in 1685, made a treaty with the Indians, and in whose Colony little friction resulted for nearly 70 years. By the end of the Revolutionary War, except in the Southern Colonies, the Indians had either been pushed westward or their ranks had been so decimated that they were no longer a menace. As the frontier moved westward so did the Indian problem. By the late nineteenth century, the red man, his ranks thinned by war and the white man's diseases, could no longer muster the strength to raise the war whoop and tomahawk.

But the picture of the struggle between the white man and the Indian is not complete unless the machinations of the French and the Spanish using Indians against the English and later the use by the English of red men against the American are told. The French used Indians to attack the English settlers in the Champlain region, on the Maine frontier, and in the Ohio and Mississippi Valleys. The Spanish fomented trouble on the southern frontier, employing Indians to harass the English just as the English did during and after the Revolutionary War in the Ohio Valley region. The stakes were very tempting, involving as they did a tremendously rich empire.

The Indians finally went down to defeat before a combination of the superior guns and organization of the whites, whiskey, diseases, and sheer weight of numbers. A lesser and inferior civilization gave way before a greater and superior one.

Population, Settlement, Immigration

Between 1607 and 1680 the population increased so that by the latter date there were about 250,000 people in the several Colonies. Until 1680 the population was predominantly English, although a few Swedes (who had been conquered by the Dutch) and several thousand Dutch

³ Marcus W. Jernegan, *The American Colonies, 1492-1750*, p. 331. New York: Longmans, Green and Co., 1930.

who had been conquered by the English in 1664 helped to make the heavy English majority somewhat more cosmopolitan. Each year new Colonists arrived by the shipload, and these, with the natural increase of a fecund and vigorous people, made for a doubling of the total number about every 25 years. In 1689 there were only 12,000 French in all Canada and the Mississippi Valley—a number decidedly in contrast with the 275,000 to be found in the English Colonies at the end of the century.

The eighteenth century witnessed a distinct change in the character of the immigration that came to the Colonies; English arrivals now were fewer in number than the German, French, Irish, Swiss, and Negroes. But a tremendous expansion in total population took place during the century, so that by 1763 there were 1,600,000 Colonists in the English settlements as contrasted with 80,000 Frenchmen in Canada. By the outbreak of the Revolutionary War, the Thirteen Colonies possessed nearly 2,500,000 people. In 1790, the first United States census showed nearly 4,000,000 inhabitants, of whom about 70 per cent were of English ancestry and about one-fifth were Negroes. From 1775 to the end of the century, a greater dispersion of population took place, so that the population per square mile actually decreased.

The rate of increase in population during the nineteenth century hovered around 35 per cent for each decade, the numbers increasing from a little less than 10,000,000 in 1820 to 31,000,000 by 1860. Even more significant than the growth of the population during this period was its steady westward trend and its great dispersion. In general, those states west of the Appalachians gained at a much greater rate than did those east of the mountains. This steady westward trend has had many important results for the country in matters of internal commerce, transportation, markets, and other kindred economic matters. Finally, after a comparison is made of the relative economic and political strength of the United States in 1790 with that of the rest of the world, a veritable revolution is seen to have taken place by 1860; for at the earlier date we were weak in numbers and relatively dependent, while by the later date we were one of the great nations of the world, virtually independent economically and with a population greater than that of England and nearly as large as that of France or Prussia.

By 1700 a fairly continuous line of settlement extended southward from the Kennebec River in Maine, a fringe not much more than five miles back from the coastline but gradually widening as it descended through Massachusetts; as it included all of Rhode Island, and as it went far inland on both sides of the Connecticut River, until the western part of the Colony was reached. There it dropped down until the Hudson was encountered, from which point it ran up past Albany and then turned south through the Fall Line of the rivers until the Potomac was reached.

On both sides of this stream the line extended westward, and then—still following the Fall Line through Virginia—continued southward to the Roanoke River, where it frayed out into the wilderness. A great gap existed between Albemarle Sound and the Southern Colonial outpost of Charleston on the Santee River (in what was later to be South Carolina), where a group of perhaps 6,000 people lived a life almost entirely separated from the rest of the Colonies.

Settlement

By the middle of the eighteenth century, the settled area had lengthened and broadened considerably until there was an almost unbroken line extending from central Maine down to southern Georgia, with one small hiatus between the colonies of North and South Carolina. Fingers of settlement stretched up the Hudson and westward along the Mohawk in New York, while in Pennsylvania the southeastern region was solid. Along the western and southern tributaries of the Susquehanna and Potomac, respectively, frontiersmen had already begun to cultivate the rich farm lands. In the Piedmont area of Virginia, the hardy backwoodsmen, penetrating southward, mainly from the Quaker colony, had established outposts against the still formidable red men. New England was almost completely settled, as was New Jersey. A fairly sizeable knot of isolated settlement existed in the Appalachian valley area in North Carolina; while along the Savannah River on the Georgia-South Carolina border, settlement reached far into the interior.

By 1800 all of New England, with the exception of northeastern Maine and the northern tip of New Hampshire, was populated. The Middle Colonies, with the exception of a wild tract in upper New York and the extreme western portion of that state, along with the adjacent northern and western part of Pennsylvania, had been brought under the sway of the white man. Southward to almost the eastern half of Georgia, the land was occupied for nearly 150 miles inland; and on the Virginia-North Carolina border, settlement had penetrated over the watershed and into Tennessee. Owing to large land grants, much of what was later West Virginia was still unsettled, although a thin line extended from the head of the Ohio down almost to the southern tip of Kentucky, and the central part of that state was fairly well populated. One branch of this settlement even dipped down into north central Tennessee. A small area just west of Pennsylvania, in the Old Northwest Territory, and isolated outposts in what was soon to be the state of Ohio, completed the settlements. The heaviest settled belt of population extended from central New England down through Virginia, barely touching North Carolina, although around Charleston, Louisville, and Pittsburgh small areas were well populated.

By the outbreak of the War Between the States, the frontier line

ran westward along the northern half of Maine across the northern half of Michigan and Wisconsin, turned southward at the eastern corner of Minnesota, bulged a little at the eastern end of Nebraska and Kansas, then went down the western border of Arkansas, and, following the Red River westward, took in almost the eastern third of Texas. The southern tip of Louisiana and the southern half of Florida were still unsettled, as was a fair-sized spot in upper central New York. The hardy pioneers had traversed the area of the Great Plains and, lured by free land, timber in Washington, rich farm lands in Oregon, gold in California, and the romantic Orient across the broad Pacific, had established themselves along the Willamette River, San Francisco Bay, and Puget Sound. Nearly 2,000 miles of plains and rugged mountains separated the two regions. By far the greatest density of population stretched from Massachusetts southwestward through the center of Connecticut past the mouth of the Hudson into the region lying between the Delaware and Susquehanna Rivers. Most of the settlements were within 50 miles of the seaboard, with the exception of those extending along the Connecticut Valley in Massachusetts, along the Hudson and a few miles westward on the Mohawk in New York, and up the Delaware in eastern Pennsylvania. Beginning along the Potomac River and continuing southward through the present confines of Virginia was the widest single area of settlement, gradually narrowing as the Roanoke was reached. Nearly a third of the people lived in New England, a similar number in Virginia and Maryland, with most of the balance in the former Middle Colonies, with the exception of perhaps 5,000 in North Carolina and twice that number in and around Charleston, South Carolina. Atlanta and New Orleans completed the well-populated urban centers in the South. That the population was quite unevenly distributed is illustrated by the fact that approximately 90 per cent of the population lived east of the Mississippi, while the remaining 10 per cent were to be found on the Great Plains and along the Pacific Coast.

Germans

New waves of non-English immigrants accounted for the deepening and widening of the settled area in the eighteenth century. Beginning in 1710, a large number of Germans, forced from their homes along the Rhine and the Palatinate by wars, persecution, famine, and simple faith, and seeking a new life with its attendant economic, religious, and relatively greater political freedom, were settled under the British Crown near Saugerties on the lower banks of the Hudson. Within three years, after having been unsuccessful in their efforts to produce naval stores (pitch, tar, resin, and turpentine) and dissatisfied with their treatment, they moved to the upper Hudson and settled along the Schoharie and the lower Mohawk. Even before this time William Penn had attracted

favorable attention in Germany, especially in the regions of the middle Rhine and the Rhenish Palatinate. As a result a number of Germans, in 1683, settled near Philadelphia at a point aptly named Germantown. As recruits from the Schoharie Valley and the Mohawk, and from the ever-increasing new arrivals, the Germans made their way to eastern and central Pennsylvania and settled on the frontier, where they became known erroneously as "Pennsylvania Dutch." By the outbreak of the Revolutionary War, nearly 400,000 had settled in the Colonies, Pennsylvania getting and retaining the bulk of them. From bitter experience they learned to avoid New England and the Southern Colonies, where they were exploited and mistreated. Settling down on the new, rich farm lands of Pennsylvania, they soon brought the land into a prosperous state of cultivation and came to be among the best farmers of their day. Not so politically minded as their Scotch-Irish neighbors, they were good, sober, industrious pioneers who bore their share of Indian and Colonial wars and who added a valuable strain to the hitherto dominantly British element.

Scotch-Irish

The narrow British economic policy, the rackrenting of land, the prohibition of linen and woolen manufacturing in Ireland in 1699, and the lack of Irish trading rights with the British Colonies, caused large numbers of Scotch-Irish from Ulster to swarm to the American Colonies early in the eighteenth century. Although there were some Scotch-Irish in Maryland and South Carolina from 1680 onward, the great migrations of Scotch-Irish began in 1708, when hundreds left Ulster for Pennsylvania, and ten years later when many more set out for New England. Between 1714 and 1720 over 50 vessels from Ireland docked in Boston harbor alone. Most of these hardy lower-middle-class immigrants found their way to Pennsylvania, where they settled in the south central part of the colony, particularly in the valley of the Susquehanna, and began the laborious task of bringing the wilderness under cultivation. Rebellious by nature, they soon caused trouble with Penn's agents, with the quitrent collectors for the Crown, and with the Indians. By 1730 Logan, one of Penn's agents and an early trader, complained that they settled in an "audacious and disorderly manner." Being land-hungry and liberty-loving, they refused to pay quitrent or taxes on their hard-won farms, and were reported to have "kept the Sabbath and everything else they could lay their hands on."

Irascible and quick to anger, they made excellent frontiersmen and fine Indian fighters. Many of the famous political leaders of that time came from their ranks, and they provided a new spirit that was necessary to push back the Indians, obtain political freedom, and gain for the common man real democracy. Such noted frontiersmen as James

Robertson and Andrew Jackson, as well as a host of others, traced their ancestry to these former Ulsterites. As early as 1732 they began to make their way south down the great Appalachian valley, and in the next decade thousands moved into the back country of Virginia and the Carolinas, where they settled and protected the Tidewater inhabitants from Indian attacks and gained a modicum of wealth for themselves from the rich valley lands. This group, like their more tractable neighbors, the Germans, had no love for the British, and this animosity presaged a bitter struggle once the Colonies and the mother country came into conflict. By 1775 there were about 350,000 Scotch-Irish in the American Colonies.

Closely allied with the Germans, and part of the same general migration, were the Swiss, who were forced from their cantons by lack of economic opportunity. Sober and industrious, they settled like the others, mostly in the backwoods and the frontier regions. Shortly after the revocation of the Edict of Nantes (1685), several thousand French Huguenots surreptitiously slipped away from Louis XIV's realm and made their way to the new country. Some of them were well-to-do bourgeois who settled in South Carolina, while others found homes and employment for their talents in Pennsylvania and other colonies. Some became pioneers, and under such leaders as John Sevier were soon pushing back the Indians and founding new settlements and states. One group deserves special mention, that band of people who early settled at Gallipolis in the Northwest Territory. Duped by unscrupulous land sellers of the Scioto Association, 600 Frenchmen made their way to the banks of the Ohio in 1791, but since they later lost most of their land through faulty title, they were not finally relieved until they had been given a Congressional grant of 25,000 acres.

Most of the new immigrants, Germans, Scotch-Irish, French, and Swiss, were newly liberated serfs or peasants, and many of them, unable to pay their passage over to America, became indentured servants, who served out their indenture and then moved to the frontier. By far the most important of the many reasons for their migration was economic betterment, and free land always outweighed any other consideration in the minds of new immigrants.

Sectionalism

A thorough knowledge of sectionalism is necessary for any real appreciation of American economic history and is a key that unlocks many of the riddles of our national life. Sectionalism stems from a feeling of economic inferiority on the one hand and from local economic or class interests on the other. It is opposed to any exaggerated or oppressive form of centralization. Its roots are found in the prevailing geographical and climatic conditions that underlie settlement in any specific region.

Thus, long before the Revolutionary War, sectionalism had arisen because of the existence of one or more of the factors listed above.

As the pioneers pushed steadily southward or westward, subdued the Indians, and brought the land under cultivation, they gradually lost touch both culturally and economically with those older establishments situated in the Tidewater area. In addition, the frontier itself imposed a new and more democratic outlook on its inhabitants. As Professor Turner has said, "The frontier regions stressed the rights of man, while the statesmen who voiced the interests of the East stressed the rights of property."⁴ This conflict first became manifest in 1676, when Nathaniel Bacon, representing the frontier, led a rebellion against the aristocratic Governor Berkeley of Virginia. Although Bacon died at the height of his power, and even though Berkeley took a terrible revenge on the western leader's followers, the revolt showed that sectionalism had reared its head in the Colonies; future events were to prove that the same problem was to continue until the present time.

In the Regulator Movement in the Carolinas, nearly a century later (1769-1771), the frontiersmen, tired of delays in obtaining a voice in the Tidewater-dominated government, desiring lower taxes, agencies of local government, and, most important of all, protection against the Indians, rose in rebellion and actually fought a pitched though losing battle with the forces raised by the planter aristocracy; "These episodes, however, were only the more spectacular events in the unceasing conflict which imbued the individualistic, liberty-loving westerners with a deep-seated distrust of governments remote from them and unsympathetic with their interests and needs."⁵

From time immemorial a frontier region has been a debtor region, and the American frontier was no exception. The outlook of the debtor frequently clashes with that of the creditor, and this play of forces between the creditor of the conservative East and the debtor of the more liberal and democratic West provides American economic history with some of its most illuminating interpretations.

International Rivalry, Trans-Appalachia, and the Mississippi Valley

Since the days of Columbus, Spain had gradually increased her control of the American continents. From 1521 onward, with the center of her colonial empire located in Mexico, she conquered and colonized, the eastern barb of her anchor being established at St. Augustine, Florida, in 1565, and the western barb at San Francisco by 1776. But the Spanish line of settlement was a thin one, and again and again the

⁴ Frederick J. Turner, *The Significance of Sections in American History*, p. 24. New York: Henry Holt and Company, 1932.

⁵ Clark, *The West in American History*, p. 341.

fierce and formidable Plains Indians beat back the frontier line from Texas to California; more important still was the fact that Spain itself was declining in power, wealth, and importance, owing to her smothering economic policy and the unwise acts of her Habsburg rulers on the European continent. Nevertheless, for more than 200 years the American march west of the Mississippi was blocked by Spain or by Spanish-speaking people.

Early in the seventeenth century, France established permanent settlements in the New World; and, as the century wore on, fur posts and towns were planted in a great arc extending from the mouth of the St. Lawrence westward along the Great Lakes and southward down the Mississippi. Thus the French hemmed in the English along the north and west. A series of wars stemming from the rivalries of the mother countries in Europe were carried over to the North American Colonies. Raids and Indian massacres characterized the bitter struggles of King William's War (1689-1691), Queen Anne's War (1702-1713), and King George's War (1744-1748), which set the stage for the struggle that culminated in the French and Indian War (1754-1763). In this last conflict, the French pressing down the Ohio came into conflict with the English, who were extending northward and westward into the same region. After a fierce struggle, the 1,300,000 English overcame the 80,000 French, and by the Treaty of Paris France ceded to England all of her colonial empire in America east of the Mississippi with the exception of a few islands off the coast of Newfoundland and in the West Indies. The region west of the Mississippi was transferred to Spain, who held it until 1800. By the end of the American Revolution, Spain and the United States were in control of the region now occupied by the latter, although England and Russia were to dispute the northern boundary.

The length and particularly the breadth of the Appalachian mountain chain had proved a great barrier to the extension of English settlement into the Ohio and Mississippi River Valleys; and although Thomas Batts had reached the headwaters of the Ohio *via* the New River as early as 1671, nearly a century was to elapse before a settlement was founded by the English in the trans-Appalachian region. By 1751 Thomas Walker had penetrated to Kentucky, using the famous Cumberland Gap on his return. By the King's Proclamation of 1763, settlers were forbidden to go west of the watershed of the Appalachians, but to the adventurous and land-hungry frontiersmen this paper Act was but a slight deterrent. Six years later James Robertson and John Sevier led a group of Virginia settlers to the Watauga Valley—the most important forerunner of the English-American movement into the Ohio-Mississippi Valley basin. By 1778 this settlement was incorporated as part of North Carolina. The coming of the American Revolution retarded but

did not stop the westward movement, and in 1775 Judge Richard Henderson formed the Transylvania Company, purchased 20,000,000 acres between the Kentucky and Cumberland Rivers from the Cherokee Indians, and, with the famous Daniel Boone as his agent, had the great Wilderness Trail blazed from the Watauga settlement *via* Cumberland Gap to the Kentucky River. Settlement soon began, and by 1777 the pioneers had submitted to Virginia, so that the region comprising the present boundaries of Kentucky remained attached to Virginia as a frontier county. By 1780 Henderson and Robertson had led a band of dissatisfied settlers to the great bend of the Cumberland and founded Nashboro (Nashville), but three years later they too were forced to submit to the claims of another older Colony, and their region became incorporated as Davidson County, North Carolina. The frontier movement took still another path when settlers from western Pennsylvania and other neighboring regions traveled up the Monongahela and established themselves on the headwaters of the Ohio. It is clear, then, that the westward movement was not a post-Revolutionary event. It is true, however, that the war extended the movement: by the exploits of the able and courageous George Rogers Clark and his band of 250 men, for example, the old French posts held by the British at Kaskia, Cahokia, and Vincennes were captured, and the region east of the Mississippi was secured to the United States by the Treaty of 1783.⁶

Settlement and the Old Northwest

At the close of the Revolutionary War the boundaries of the United States were, roughly, the Mississippi River on the west, Florida on the south, the Atlantic on the east, and the Great Lakes and the St. Lawrence on the north. In the unsettled region lying north of the Ohio several states had western claims, but these were finally resolved, New York first ceding her claims in 1781 and Georgia ending the state cessions in 1802. Thus, with the exception of certain small areas reserved for special uses, the western lands had been ceded to the Government of the United States.

As a result of the war, many of the European feudal vestiges that had secured a foothold in the Colonies were swept away. Such institutions as quitrent (a small fee collected by the Crown or by proprietors), primogeniture (a system whereby the land was granted to the eldest son), and entail (a legal provision that made it almost impossible to alienate an estate) were removed either as a result of the fight against England or through the earnest efforts of the Jeffersonian party. In addition, many large estates formerly in the hands of wealthy Tories were broken up and sold for the benefit of the Colonies. A more demo-

⁶ This did not include Florida, which was in the hands of the British from 1763 to 1783, when it was turned over to Spain.

cratic system of landholding replaced the former aristocratic semifeudal form of land tenure.

One of the most serious consequences of the Revolutionary War was the relatively large public debt that faced the country at the end of the war. The chief asset that the Government possessed was the public domain or land ceded by the states to the Federal Government, especially that portion located north of the Ohio River. In general, the older states believed that the public lands should be held as an asset for the future, should be made hard to obtain, and should be kept fairly expensive. The South believed that the public lands offered serious competition to its tobacco and cotton lands, while the East feared that the cultivation of new, rich soil would lower the value of its older, somewhat worn, and only fairly productive fields. In addition, the Eastern manufacturers saw the West draining away an all-too-scarce supply of labor, and feared that this would result in higher wages for workers. Western sentiments prevailed, however, and the public domain was parceled out on comparatively easy and generous terms.

In order to reimburse her soldiers whose homes had been burned by the British raids during the war, Connecticut reserved in the Old Northwest a strip of land 120 miles wide in the northeast corner of Ohio, while Virginia reserved 6,000 square miles between the Scioto and Little Miami Rivers in order to redeem her military bounty certificates. Congress reserved, for the same reason, bounty lands between the Scioto and the Seven Ranges. All the rest became the basis⁷ of the 1,441,-436,160 acres that the Federal Government has owned at one time or another.

Under the Articles of Confederation, Congress passed the justly famous Ordinance of 1787. From a background dark with greed and land speculation there emerged one of the truly great land laws of all time. The chief provisions of the act stipulated that not less than three nor more than five states could be created from the Northwest Territory, that slavery and involuntary servitude should be prohibited, that after a period of rule by Congressional appointees any region, upon attaining 5,000 adult, free, male citizens, could have a separate territorial government; and that, upon achieving 60,000 free inhabitants, the region might be granted statehood with full equality with any state in the Union. The last provision was revolutionary in its extension of the democratic principle. But economically the prohibition of slavery was the most important feature of the Ordinance.

The Ordinance of 1787 was passed largely in response to the machinations of a group of land speculators headed by the Reverend Manasseh Cutler, who, with his henchmen, some of whom were in Congress, had

⁷The public domain was enlarged greatly during the nineteenth century as new additions were made by conquest or by purchase. See below, pages 102-104.

formed the Ohio Associates. They purchased nearly 2,000,000 acres of land with depreciated soldiers' script worth about 12 cents on the dollar, and, coupling their scheme with the Scioto Associates, which secured a grant of nearly 5,000,000 acres, were able to bring pressure to bear on Congress. In the spring of 1788 the Ohio Associates settled Marietta, Ohio, at the mouth of the Muskingum River near the protecting guns of Fort Harmar. A few months later Judge John Cleves Symmes acquired a grant of nearly 1,000,000 acres between the Great and Little Miami Rivers, and set about founding the city of Cincinnati. The Scioto Associates, without having secured title to their grant, sold about 3,000,000 acres to a French company, and in 1790 the duped Frenchmen settled Gallipolis on land that William Duer hastily purchased from the Ohio Associates. Six years later, Moses Cleaveland bought most of the Connecticut Reserve and founded Cleveland on Lake Erie. Meantime Congress had provided the first territorial governor in the person of Arthur St. Clair, a former companion-in-arms of Washington. After an initial setback suffered by St. Clair at the hands of the Indians but later rectified by "Mad" Anthony Wayne at the battle of Fallen Timbers in 1794, settlement rapidly got under way. The rate of growth of the population in the area is indicated by the admission, as states, into the Union of Ohio in 1803, Indiana in 1816, Illinois in 1818, Michigan in 1837, and Wisconsin in 1848.

Settlement in the Southwest

Until 1800 most settlers drifting to the frontier went south of the Ohio River rather than up into the Old Northwest. The main reasons for this were that the regions of Kentucky and Tennessee had an earlier start; moreover, land titles were cleared in the southern region earlier than they were to the north. Then, too, as the land of the older Southern Colonies began to show the ravages of too constant cropping, the wealthier landowners began to exert economic pressure on the poorer tenants and slowly forced them up into the hill country. Although the Cherokee, Choctaw, Creek, Chickasaw, and Seminole Indians were a barrier, they were not so formidable as the Indians in the Old Northwest. A real obstacle and irritant to settlers and to settlement in this region was the presence at the mouth of the Mississippi at New Orleans of the Spanish, who denied to the casual settler and trader the right of deposit of his products. Not until 1795, when Pinckney obtained that right for a three-year period, were the frontiersmen placated. But whoever controlled the mouth of that stream held the stopper to the great bottle of the Mississippi Valley.

The settlements of Boone, Henderson, Robertson, and Sevier bore fruit within a few years, for by 1792 Kentucky became a state and four years later Tennessee was granted statehood. Shortly after 1800 these

settlers began to move northward to the Old Northwest and to a new "frontier." Those who remained were forced toward the mountains, and some became the familiar "Hill Billies" celebrated today by song, feud, and the radio.

Georgia, the last settled of the original Thirteen Colonies, also comprised in the eighteenth century what are now the states of Alabama and Mississippi. In 1795 the Georgia Legislature sold to four land companies, at an average price of $1\frac{1}{2}$ cents an acre, some 50,000,000 acres of land located in and around the Yazoo River. Many of the grantees were legislators, who hastened to unload their unsavory titles, and none too fast, since the next legislature repealed the grants. Before this happened, however, many unwary investors had purchased land in good faith, and even the Supreme Court and Congress were hard pressed to unscramble the mess. Settlers were attracted to Mississippi earlier than they were to Alabama, so that Mississippi was admitted as a state in 1817, while Alabama had to wait two years longer. Indian trouble accounted for part of this delay; indeed, the Seminole War dragged on until 1842, and a few aborigines who took to the Everglades are still technically at war with the United States. But the migration of Seminoles to Florida did not save them from the advancing frontier; Florida, which had been sold to the United States by Spain in 1819, was admitted as a state in 1845.

Land Problems and the Public Domain

During Colonial times no good system of land survey existed; a great deal of land was granted under the old haphazard system of "metes and bounds." As the land became more thickly settled, this led to innumerable difficulties and to many legal suits and disputes. Indeed, "law" became a verb in New England! The Confederate Congress proceeded to deal with the problem of land survey by passing the Ordinance of 1785, which provided for the system of rectangular survey, a system that was extended to all new lands acquired except the original states, Kentucky, Tennessee, and Texas. In short, all land that became part of the public domain was and is surveyed under an exact and regular system.

Although the system of rectangular survey possesses great merit, it did not operate effectively and efficiently in the region between the 98th meridian and the Rocky Mountains, for here water, not land, was the controlling factor. In the dry and arid region of the Great Plains, the size of the land unit was often too small to be of any practical value. For most regions possessing a plentitude of land, wood, and water, the act has been of incalculable value, inasmuch as it permits of precise and exact definition of each parcel of land.

The Ordinance had political as well as economic implications; the

creditor of the East thought that the size of the land unit granted to settlers should be large and costly enough to prevent the "little fellow" from getting a cheap "stake in the country," while the debtor of the West believed that the unit at worst should be small and cheap and at best should be altogether free. As the years rolled on, the Western viewpoint slowly but surely was adopted, until its complete victory was signalized by the passage of the Homestead Act of 1862.

The rectangular system of land survey operated as follows: a base line running east and west and a principal meridian running north and south and intersecting each other at right angles were first established in the wilderness by the surveyors. From these lines, perpendiculars were run out by the surveyors at six-mile intervals. Thus the land was divided into squares containing 36 square miles each. Each square was a township, which was in turn divided into 36 squares of one square mile each and containing 640 acres (commonly called a "section"). Section 16 was reserved for the support of schools, and after 1842 most states reserved section 36 as well. The squabble between the East and the West raged over the size of the minimum unit offered for sale, the terms of payment, and matters of a like nature.⁸ The following table tells the story of the development of the Government land policy and the increasing victory of the Western attitude.

<i>Act</i>	<i>Minimum Unit in Acres</i>	<i>Minimum Auction Price per Acre</i>	<i>Terms of Sale</i>
1785	640	\$1.00	Cash, ½ by township; ½ by sections
1796	640	\$2.00	[½ cash, ½ credit (1 yr.)]
1800	320	\$2.00	(¼ cash; ¾ 2 yrs.; ¼ 3 yrs.; ¼ 4 years.)
1804	160	\$2.00	Same as in 1800
1820	80	\$1.25	Cash
1832	40	\$1.25	Cash

Thus, while in 1785 it took \$640 to purchase a Western farm, by 1832 a start could be made for only \$50. In general it can be said that, while the public land policy of the Federal Government has not been financially successful, it has been of great value in getting the land settled quickly and getting land into the hands of a large number of people, although not all of them lived on the land. Indeed, speculation in Western lands has been a game for the American people almost from the beginning of settlement.

⁸ Settlement quickly pushed ahead of the surveys. Squatters technically were law-breakers; but, as they improved the land and added value to it, Congress in 1841 passed a Pre-Emption Act that allowed the squatter to have first right to purchase his holding at the minimum price per acre. Certain lands were regarded by the pioneers as unsuitable for settlement; in 1854 Congress passed a Graduation Act, which reduced the price of such land according to how long it had lain unpurchased. Thus, land unpurchased for 30 years sold by law at 12½ cents per acre.

Rounding Out the Borders

As a result of the Pinckney Treaty of 1795, the cork was pulled from the bottleneck of the Mississippi and Ohio Valleys and the trans-Appalachian region as well. Within a few years the pressure of European affairs brought to the United States the tremendous empire of Louisiana. As a result of the French and Indian War, France had transferred this great region to Spain; but with the rise of Napoleon, Spain retroceded it to France by the secret treaty of San Ildefonso in 1800. When news of this action reached the United States, great uneasiness was felt; it was one thing to have Louisiana in the hands of a comparatively weak power like Spain, but—from the American standpoint—it was quite another matter to find it in the hands of the expanding imperialistic power of France, then under the sway of the “Little Corporal.” Girding for war and fearful that the prize might fall into the hands of England, his archenemy and nemesis, Napoleon offered the whole region to the astonished American Minister Livingston for the paltry sum of \$15,000,000, an offer that was soon taken. The purchase in 1803 had vast significance for the future power and greatness of the United States; although the boundaries were somewhat indefinite, the addition of Louisiana doubled the land area of the nascent world power.

The acquisition of Florida from Spain was the next episode in the history of our expanding public domain. In 1810 the United States took possession of the territory from West Florida to the Pearl River, and three years later added the small strip that included the area from Mobile Bay to the Perdido River. Then in 1819, Spain, fearful of losing all the rest to the young giant of the north, sold the balance of Florida to the United States for about \$5,000,000. Part of the treaty consummating this transaction was devoted to a definition of the western boundaries of Louisiana, and under it Spain gave up her claims to any territory north of the 42nd parallel, thus removing herself as one of the contestants for the region later known as the Oregon Country.

Louisiana, settled since early in the eighteenth century, was admitted to statehood in 1812, and from this area a constant stream of Americans invaded the region to the west, the present state of Texas. Beginning in 1821, when Moses Austin obtained a land grant, which was conferred at his death on his son Stephen, land-hungry pioneers streamed into the rich agricultural and grazing lands in Mexican Texas. Although the movement had all of the characteristics of a regular extension of our frontier, it caused considerable repercussions at the time, New Englanders and Abolitionists accusing Southern slaveholders of a plot to extend the boundaries of their “peculiar institution.” Within 20 years more Americans flocked to the new territory than Spain had been able to settle on it during her 300 years of colonial administration. By 1836 the

Texans, after a series of bloody battles with Mexico, had secured their independence, and Texas stood as a free nation of slaveholding Americans, a status that she maintained for the next nine years. Then in 1845, as a result of politics, the sale of Texan script and bonds, and the natural workings of "Manifest Destiny," Texas was admitted as a state. Because of her former national existence and because of her public debt, most of the public lands were retained by Texas and were never a part of the public domain. Owing to the huge size of the state, Texas was given the right to form herself into as many as five states.

Still another chapter in the history of our public domain needs to be recounted. Shortly after the Revolutionary War, and just at the time when the struggling young nation needed new markets to replace those lost by severance from England, hardy New England shipmasters began to send their ships around Cape Horn and up to the Northwest coast for furs. This maritime trade (Indian trinkets for furs, furs for Chinese goods, Chinese goods for the New England market), based first on the sea otter and later on the fur-bearing seal, made known the Oregon Country to the Americans. Four nations had claims to this region—Spain, Russia, England, and the United States. The Spanish and Russian claims were based on discovery and occupation. Spain relinquished her claims by treaty in 1819, and Russia agreed to stay north of $54^{\circ} 40'$ by the treaty of 1824. Meantime, in 1818, as part of the treaty agreement defining the northern boundary between Canada and the United States at 49° west to the "Stony" mountains, England and the United States had agreed to occupy jointly the Oregon Country. The region, embracing what are now the states of Oregon, Washington, Idaho, and parts of Montana and Wyoming, was rich in furs (mainly beaver), fine valley farm land, and timber. Although first exploited by fur traders, in the 1840's missionaries and American settlers came in increasing waves. The sheer weight of numbers, plus a declining fur market,⁹ tended to swing the scales in favor of the Americans. By the treaty of 1846, England agreed to draw the northern boundary westward from the Rocky Mountains along the 49th parallel to the sea, Vancouver Island excepted. Thus, by the middle of the nineteenth century the United States had an unbroken sweep across the northern part from the Atlantic to the Pacific. Oddly enough, settlers traveled clear across the former Louisiana Purchase to settle in Oregon. Henceforth the United States had both an eastward- and westward-moving frontier line.

Just at the time that the Americans were getting interested in Texas, Mexico declared her independence from Spain (1821). Since the Mexi-

⁹ Strictly speaking, the only part of the Oregon Country that was in dispute between England and the United States was that part lying west and north of the Columbia River.

can Government had never recognized Texan independence, the admission of Texas as an American state made war inevitable. In 1848, after two years of sharp fighting during which Mexico was invaded, Mexico, by the treaty of Guadalupe Hidalgo, ceded to the United States the region west of the Texas boundary and south of the 42nd parallel to about the 33rd parallel.¹⁰ It was agreed that the sum of \$20,000,000 should be paid to Mexico and that this payment should settle all American claims. There were few Americans in this whole region, and the acquisition of this territory did not generate the usual pioneering process or any comparable extension of the westward movement.

Almost as a footnote to the Mexican cession came the Gadsden Purchase of 1853. A small strip of territory lying just south of the cession territory was desired by the United States for a better railroad route across the mountains. The Mexican maps showed the southern boundary of New Mexico to be south of the boundary drawn in 1848. Hence James Gadsden made this purchase for the United States, for \$10,000,000, the highest price per acre ever paid by the United States for any considerable extension of its boundaries.

There also occurred, in the northeastern part of the United States, another extension of the frontier; here the direction was east and north rather than west or south. The northeastern boundary between the United States and Canada was finally settled by the Webster-Ashburton Treaty of 1842 after a humorous "Battle of the Maps" in which the American maps showed the boundary to be farther south than the Americans claimed while the British maps showed it to be farther north than the British insisted.

As a result of all these events, in the short space of 50 years the United States carved from the continent of North America by purchase, war, and diplomacy a country whose land area totaled over 3,000,000 square miles, a territory 15 times the size of France and about 25 times the size of the United Kingdom. Giant strides were made in those 50 years. But the political expansion was only the beginning; under the heading of unfinished business came the exploration and development of this vast new region.

Exploration and the Great Western Trails

In order to learn something about the climate, topography, and resources of the newly purchased Louisiana region, President Jefferson, in 1804, sent out the Lewis and Clark expedition to explore and to report their findings. Ascending the Missouri and wintering at Fort Mandan, they continued westward over the Rockies and down the Snake and Columbia Rivers and spent the second winter at Fort Clatsop, in the

¹⁰ Although gold had been discovered in California early in 1848, neither the American nor Mexican commissioners knew it at the time the treaty was signed.

Oregon Country on the shores of the Pacific. They returned in 1806 to make their report. Previous to this, in 1792, Captain Robert Gray, of the Ship *Columbia*, had discovered and entered the great river that bears the name of his ship. These explorations provided the basic claims of the United States to the Oregon Country.

Then came systematic exploration of the Great Plains. Early in the nineteenth century fur traders and explorers roamed over the vast expanse of territory lying west of the Mississippi. John Colter, Robert Stuart, Jim Bridger, N. J. Wyeth, the Sublette brothers, Jedediah Smith, and a host of others contributed to local knowledge of the areas they explored. Missionaries such as Jason Lee, Marcus Whitman, and Father De Smet soon followed, carrying Christianity in the wake of the fur trader. These intrepid pioneers made known many of the mountain passes, the rivers, and the ranges of the region. Most important among the mountain passes was South Pass at the head of the North Platte, in the southwestern corner of what is now the state of Wyoming; over this pass thousands of settlers crossed on their way to the rich farm lands of the Willamette Valley in Oregon or to the gold fields of California.

The army, too, had a large share in making known the new wilderness. Lieutenant Zebulon M. Pike explored the headwaters of the Mississippi in 1805-1806, and in 1806-1807 went westward from St. Louis over to the head of the Colorado and on to the peak that now bears his name. John C. Fremont, "the Pathfinder," traversed much of the region west of the Rockies between 1842 and 1844, revealing new information and putting on a scientific level the facts obtained in his journeys. By 1853 Congress ordered and provided the funds for a scientific railroad survey to determine the most practicable route that would connect the Mississippi with the Pacific Coast. Five surveys from the 49th down to the 32nd parallels were made between 1853 and 1855. The result was a series of well-organized, scientific expeditions, carried out for the most part under army leaders, that not only brought to light new information but also co-ordinated old but little-known geographical facts. The southernmost route was recommended by Secretary of War Jefferson Davis as the most practicable; but, owing to sectional differences between the South and North, no action resulted until the approaching war removed one of the contestants. That the work was well done is illustrated by the fact that the transcontinental railroads, when built, largely followed the paths indicated by the surveys.

As the American frontier pushed west of the Mississippi, great trails began to appear over which lumbering men and beasts proceeded westward, sometimes ahead of but usually behind the explorers. Early in the 1820's, American traders began to supply the Spanish outpost of Santa Fé with such trading goods as were capable of withstanding the

rigors and the cost of the long, slow journey. Trinkets, beads, and cloth, both fabricated and coarse, made up the bulk of the goods going to Mexico, while mules and beaver skins, plus silver and gold bullion from the rich Mexican mines, made up the return load.

At about the same time that the Santa Fé trading trail was coming into prominence, trappers, traders, missionaries, and finally settlers began to cross the Great Plains *via* the Platte River and South Pass over what became known as the Oregon Trail. Starting at Independence, Missouri, the trail ran in a northwesterly direction until it struck the southernmost bend of the Platte; then it followed along that stream to the Clearwater, over the Rockies by means of the wide gateway known as South Pass, and thence up to the Snake River and along that stream until near the present site of Boise, Idaho, where it branched off to strike the Columbia. Nearly 2,000 miles long, it was perhaps the greatest trail and carried more pioneer settlers to new homes than any American pathway. People rather than goods moved over this trail, and the first large migrations, beginning in the 1840's, soon marked a broad path for the thousands who were to follow. Near Fort Hall in southeastern Idaho a southern branch, the California Trail, led across Utah, Nevada, and California. During 1849 literally thousands jammed the trail in their efforts to get to the gold fields. Indians and disease dogged the path of the homemaker and miner, and thousands of graves and skulls gave mute testimony to the toll exacted by nature and the red men. On the north bank of the Platte ran a famous counterpart of the Oregon Trail, for here was to be found the Mormon Trail, which paralleled the former until it reached South Pass, where it branched southward to Salt Lake City, founded in 1847 by the great leader of the Mormon Church, Brigham Young. In the valley of the "Great Salt Lake, the Mormons, employing irrigation from the neighboring streams, settled and founded a thriving colony. This desert outpost, established miles from any regular settlement, was engaged mainly in agriculture and cattle raising, although trading with the "forty-niners" and later comers was profitable to both parties. South of the Santa Fé trail, the Overland Mail trail led from St. Louis, *via* Fort Smith, El Paso, Tucson, and Fort Yuma, up through the interior of California to San Francisco. Mail and people were carried west or east in about 25 days by lumbering mail coaches. This slender communication thread was superseded in 1869 upon the completion of the Union and Central Pacific railroads. But even before the railways came, the region west of the Mississippi was fed by several great arteries that carried goods and people into the West from the settled East.

Beginning in 1825 under President Monroe, the Indians in the Old Northwest Territory and in the old Southwest (east of the Mississippi) were removed from their old homes and settled west of the river; by

1841 many of the most formidable tribes had been relocated in what is now Oklahoma.¹¹ Gradually, as the whites pushed westward, and inevitable clashes occurred the Indians were squeezed southward and northward into smaller and smaller tracts that soon became known as "reservations." In the 1860's and 1870's Indian wars from Minnesota to California resulted in defeats for the red men, who were rounded up and put on reservations throughout the West. As time went on and the covetous whites encroached on the Indian lands, even these reservations were decreased in size. In addition to the toll caused by the white man's whiskey and by his diseases, the destruction of the buffalo, which had been the Indian's chief source of food supply, so decimated the Indian ranks that by 1880 they could no longer contest by any show of force the land that once was theirs.

Economic Activities and Frontier Life

The great incentive to the fur trade in North America was the beaver, inasmuch as his pelt commanded a good price in England and on the European continent. Until the middle of the nineteenth century, many articles of men's clothing were made from beaver fur, especially men's hats; but, about 1840, stylists decreed them no longer fashionable and dealt a death blow to this great activity. In addition, settlement and agriculture put an end to trapping as a profitable occupation. While other furs such as marten, muskrat, and fox, to say nothing of buffalo hides, were also gathered and sold, the beaver was always the backbone of the trade.

Although many individuals engaged in trapping as individuals, presently great fur companies arose to exploit the trade more efficiently and effectively. John Jacob Astor, a German immigrant, began to operate his companies in the latter part of the eighteenth century, and expanded his activities in the nineteenth, founding his fortune on this trade. His business extended from New York across the continent to Astoria (Oregon), which he founded in 1811. British companies, too, engaged in the fur trade in what is now United States territory; the most prominent of these companies were the Northwest Company and the great Hudson's Bay Company, and these firms contested the rich Oregon Country in the early years of the nineteenth century. The Great Plains and the Rockies were dominated by the American Fur Company; early in the century this company began to send out parties to trap for it. It evolved a new trading institution, the *rendezvous*, which was a meeting place for traders and trappers, usually in some small valley in the Rockies. There in the late spring trappers, traders, and friendly Indians met for a week or ten days to carouse, swap furs for trinkets, goods, whiskey

¹¹ To this day, three-fifths of the Indians are located in Oklahoma.

or metheglin, and to forget the cares and dangers of a hard and uncertain life. Great profits were made for both the fur trade in general and the managers of the *rendezvous* in particular.

Whether the frontier was in Indiana or Idaho, the process was much the same. Close on the heels of the trapper came the pioneer or early settler, who in wooded regions built the familiar cabin or "lean-to" and scratched a few acres of ground and planted his scanty crop of corn, beans, pumpkins, and grain. He combined fishing and hunting with his agricultural pursuits, wresting a precarious living from his surroundings. Within a few years he was usually bought out; normally, he moved west again, and his place was taken by the familiar farmer, and the old process of settlement and introduction of capital and industry was begun. In the region immediately west of the Mississippi, on the open and rolling plains, only the turning of a furrow and the planting of a crop was needed, and here the sod-house frontier began an existence all its own.

The early pioneer, owing to lack of cash and transportation, was forced to make most of the things he used in everyday life. Tables, chairs, dishes, houses, and a host of other articles were fashioned by hand mostly from the convenient timber surrounding him on every side. The Ohio and Mississippi Rivers, with their tributaries, furnished a waterway upon which to float his trading goods to market. Certain necessities, such as salt, lead, iron, and gunpowder, were usually purchased in town or city; but except for these, the pioneer was largely self-sufficient. "Homespun," although now merely a type of cloth, had a literal meaning for most people on the frontier. Because life was rough, crude, hard, and dangerous, few people of culture and means were attracted to the frontier, and hence the pioneers in general represented the great body of lower middle class, some of whom through their own efforts were able to amass comfortable fortunes. The bullets of the Indians respected neither wealth nor social position, and helped to make the frontier a great leveling institution; all had to face the same hardships and dangers, and a man stood out above his neighbors because he possessed the virtues of hardihood, fortitude, knowledge of woodlore, leadership, and hunting sense. The great heroes of the frontier were successful Indian fighters and early trail blazers, rather than cultured aristocrats or financiers.

Although the westward movement was primarily an agricultural advance, certain regions west of the Mississippi owed their settlement to unforeseen and unusual reasons. Gold was one of these. Early in 1848, the precious metal was discovered in the American River on the land grant of John Sutter near Sacramento, California. The news soon leaked out, and, in 1849, thousands came to the diggings. Some came around the Horn on the all-water route, some by boat to Panama and by

land across the Isthmus and again by boat up the coast; but most, for economic reasons, chose the longer, slower land route over the Oregon and California Trails—40,000 are estimated to have crossed the plains in 1849 alone. By 1850 more than 100,000 miners were the basis for the admission of California as a state. Gold was discovered in Oregon three years later, and in 1858 the precious metal was discovered in the Pike's Peak region; thousands now joined the rush to this last strike, many bearing signs on the sides of their wagons "Pike's Peak or Bust," only to return a few years later with the sad news "Busted By Gosh" painted under their former hopes.

The mining frontier engendered lawlessness and attracted the most dissolute men and women in the towns that mushroomed with each reported strike. Economically the miners furnished a growing market for the foodstuffs produced by the more prosaic farmer. The better elements soon evolved an extra-legal organization known as the "Vigilantes" to take care, in summary fashion, of robbers, brigands, and highwaymen, before the advent of United States law and order. Near Carson City, Nevada, in 1859, was found the marvelously rich silver strike, the Comstock Lode, and inspired miners traversed most of the mountainous regions in their search for gold and silver. As time went on, the rich placer or gravel bars soon gave out, and the great amount of capital needed to exploit the quartz or hard-rock mines led to their coming into the hands of large mining interests. Meantime, however, the mining fever gave great impetus to an eastward-moving frontier from the Pacific Coast.

Influence of the Westward Movement

The movement of the population westward has had great effect on the political, economic, and social development of the United States. The state constitutions of the Western states were almost invariably more liberal than those of their Eastern neighbors, although many of their provisions were copied by the more conservative East. The West gave rise to new political parties, and Jackson's concept of democracy typified the spirit of the pioneer and frontiersman in his disregard for form, in his attack on the Second Bank of the United States, and in his strong nationalistic stand with regard to South Carolina and nullification. Lincoln, too, with his tolerance, his simple ways, and his great humanity, was to become a symbol of the democratic spirit, fostered and nurtured in the cabins of the frontier. As the time grew closer for the trial by arms of the Republic, the West held the balance of political, especially Senatorial, power, between the North and the South, and this enabled Western statesmen to secure many advantages for their respective regions.

Economically, the westward extension of the population has meant a

great consuming market for Eastern manufactured goods; Henry Clay's "American System" embodied this idea in an effort to promote harmony among the sections of the nation. Then, too, as new regions were settled under the jurisdiction of the United States, old international boundaries were no more, and trade barriers were destroyed. As population spread westward, new regions came into production, increasing immeasurably the diversity of products and leading to greater exchange among the sections. Although, at first, most Western products were floated down the rivers to New Orleans, by the time of the outbreak of the War Between the States a great deal of the West had been firmly united to the East by bands of railroad iron and gave its weight in men, material, and productive capacity to the North in that struggle. As a sponge for Eastern capital, the West provided an attractive field for investment (and speculation) and turned American capital toward internal improvement rather than to European or world markets. The constant draining of manpower from the East to the West tended to maintain or even to increase the wages granted to the Eastern laboring classes. Finally, the demand on the part of the West led to better transportation facilities in the matter of roads, river improvements, canals, and railroads.

Socially the West has stood for democracy, and the pioneering process has tended to level the extremes in wealth and to break down the caste barriers engendered by older and more stable societies. The basis of this attitude is intimately connected with the public domain, and, as Professor Turner has well said, "The free lands of the United States have been the most important single factor in explaining our development."¹²

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¹² F. J. Turner, *The Significance of Sections in American History*, p. 17. Inherent in the Turnerian thesis is the concept of the West as a "Safety Valve," that is, that so long as free (or nearly free) land existed, almost anyone could and would remove himself to the frontier when economic or social conditions became depressed at home. In recent years scholars have assailed this idea with considerable vigor and partial success.

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CHAPTER 6

Agricultural Technology to 1880

Early Tools and Methods

THE TOOLS with which the men of the Colonial period of American economic history went about their tasks were those that had been in use for many centuries in Europe; indeed, most of them were little changed from Roman and even earlier times. In its domesticated animals American agriculture was also heavily dependent upon its European sources, the turkey being the most significant American contribution. Importations from Europe supplied the original American domestic livestock, and continued borrowings were influential in improving herds and flocks. In other respects, the conditions faced by agriculture in America gave rise to changes sharply differentiating it from its European prototype. Although the small grains of Europe, such as wheat, oats, barley, and rye, were important crops from the beginning, the three plants that became the bulwark of American agriculture early in the Colonial period and that have remained so ever since were Indian contributions;¹ corn was the chief food crop, and tobacco and cotton the foremost market products. In his treatment of the soil the New World farmer also deviated from the practices prevailing in Western Europe. The American farmer was profligate in his treatment of land; destructive practices displaced the careful conservation of soil fertility developed in Europe from centuries of experience.

The American farmer approached the problems of exploiting a continent in a spirit of adventure. He was governed by few if any of the restraints saddled upon the European by centuries of traditional practice. He was to some extent skeptical of "book farming," but this attitude was not unreasonable, for much agricultural literature as late as the 1830's or 1840's had reference to European conditions and, therefore, was not pertinent. Furthermore, much of it had neither scientific nor economic foundations. Of greater consequence was the fact that there existed among the farmers of this country a class, doubtless a

¹ A brief and interesting discussion of these matters will be found in Carl O. Sauer, "The Settlement of the Humid East," U. S. Department of Agriculture *Yearbook* 1941, pp. 157-166.

minority but nevertheless significantly large, who were eager in their search for opportunities and aggressive in their exploitation of them. The American farmer was characteristically foot-loose in his attitude toward his land and correspondingly fancy-free. His disposition to indulge in speculative activities and to accept risks was certainly not less pronounced than that of other elements of the population. The attractions of Western lands and mining claims were as great to him as to his urban relatives. Indeed, numerically considered, the ordinary farmer or planter was among the principal speculators in land. In the West he was typically land-poor; in fact, throughout the nation, farms or plantations commonly comprised acreages exceeding that which the operator could reasonably hope to cultivate with the available manpower. The farmer was likewise an active participant in economic and political movements that held out to him the hope of improving his market position. The demand for new agencies of transportation, such as the turnpikes, canals, and railroads, came in large part from agricultural interests. This receptive state of mind extended also to activities more immediately concerned with the cultivation of land. The lessons in open-mindedness that were forced upon the early settlers and resulted in their adoption of Indian plants and techniques were not forgotten. European tools and methods were employed, modified, or abandoned to suit the requirements of the American situation. European methods of crop rotation and of soil fertilization were not long continued by European farmers on American soil; such practices were abandoned to reappear only when changing conditions encouraged their development in a form adapted to American needs.

Although new land for cultivation had to be reclaimed from virgin forest and grassland, and although the difficulties and costs of clearing were great, efforts to maintain soil fertility were considered uneconomical by most settlers. On new land planting of the same crop was generally repeated until the inevitable decline in production was so great that the profitability of continued cultivation of the field was questionable. The process of exhaustion might take twenty years; it sometimes occurred in five. Declining productivity encouraged migration to the fresh lands of the West. As an alternative to migration, methods aimed at renewing soil fertility were adopted by some farmers in many of the affected areas.

These methods included the rotation of crops, cultivation of legumes, the improved use of fertilizing agents, and the control of soil erosion.² Rotation of crops was practiced very early in eastern Pennsylvania, was common in New England by 1800, and in eastern New York, New

² For a brief résumé of the work of the pioneers in this field, see Angus McDonald, *Early American Soil Conservationists*. Washington, D. C.: U. S. Department of Agriculture, Miscellaneous Publication No. 449, 1941.

Jersey, Virginia, and the older South by the 1840's.³ The same technique was followed to a limited degree in many parts of the West by the 1860's and became common in the ensuing decades. Animal fertilizers were regarded as a worthless nuisance so long as the soil retained its pristine fertility. It was, for example, quite generally the fashion in the earlier years of cultivation in a given area to "compute the expense of moving the barn or the manure and very frequently the barn was moved as the lightest job; and that was only done when the cattle were likely to mire in the dung." As the yield of the soil declined with continued cultivation, the value of applying manure to the soil came to be recognized. At first merely the readily available manure was utilized. Later care was exercised to conserve and to increase the supply, and eventually attention turned to the use of artificial fertilizing agents. The introduction of such supplementary fertilizing materials was not the least important innovation in agricultural practice in this period.⁴

The utilization of lime, marl, gypsum, and other calcareous materials commenced in the late 1830's. Credit for calling the attention of the public to the utility of these agents belongs to Edmund Ruffin of Virginia.⁵ In the late forties, guano was introduced and found wide use in the next decade along the Atlantic Coast north of Virginia. Chemical fertilizers, such as superphosphates, were also coming into use in the fifties. A significant development that became important in the South in the late forties was the practice of using cottonseed as a fertilizer, instead of destroying it as a waste material.

Interest in New Crops, Methods, and Tools

The American farmer has typically entertained a deep interest in new plants and new breeds of livestock. His concern with such innovations in the first half of the nineteenth century was particularly great; indeed, a series of speculative fervors swept the country, centering at one time upon one object and then upon another. In some cases all contact with rational calculation was lost, the enthusiasm becoming so intense as to take on the character of a mania. Among the first

³ See Arthur R. Hall, *The Story of Soil Conservation in the South Carolina Piedmont 1800-1860*, (Washington, D. C.: U. S. Department of Agriculture, Miscellaneous Publication No. 407, 1940); and Avery O. Craven, *Soil Exhaustion as a Factor in the Agricultural History of Virginia and Maryland, 1606-1860*, (Urbana: University of Illinois Studies in the Social Sciences, Vol. XIII, No. 1, 1925), for detailed analyses of developments in restricted areas.

⁴ Of particular importance was the publication of Justus Liebig's *Organic Chemistry and Its Applications to Agriculture and Physiology*, Cambridge, 1841. See also: Charles A. Browne, "Justus van Liebig—Man and Teacher," pp. 1-9 in Faust Ray Moulton (ed.), *Liebig and After Liebig: An Analysis of Progress in Agricultural Chemistry*. Washington, D. C.: Publication of the American Association for the Advancement of Science No. 16, 1942.

⁵ Edmund Ruffin, *An Essay on Calcareous Manures*. Petersburg: 1832.

of these speculative eruptions was that centering upon the importation of Spanish Merino sheep in the years 1810-1815. After the collapse of the excessive prices brought about by this boom, similar speculative activity focused upon the Saxon Merino during the years 1822-1826. Interest in the importation of improved European breeds of cattle developed after 1820, although this wave of enthusiasm followed a more moderate course. Blooded horses and Berkshire hogs, among other animals, took their turns in the public limelight. More absurd than most of the speculations was the "fowl mania" or "hen fever" that ran its course from 1849 to 1855 and that raised to fantastic heights the prices paid for specimens and sometimes for single eggs of the larger breeds of Asiatic poultry. Although individuals occasionally lost small fortunes in the speculations, on the whole substantial public benefit followed them in the establishment of superior breeding stocks. An accompanying development of great significance was the growth of livestock registration and breeding associations.

Similarly, in the plant world speculation moved from one newly introduced plant to another. Public enthusiasm focused its attention upon the mulberry from 1832 to 1839; but since, in the absence of large-scale culture of the silkworm, the plant possessed no true economic significance whatsoever, the boom collapsed. The credulous purchased and planted broom corn in 1837 and Chinese tree corn in 1839-1841. With the encouragement of the United States Patent Office,⁶ they planted Chinese sorghum during the early fifties for the purpose of producing sugar for home consumption. In the same decade the Osage orange became the object of much speculative interest and of public enthusiasm as a substitute for wooden fences, which were difficult to provide on the prairies. Excitement of a speculative character frequently attached to the introduction of new varieties, alleged as well as real, of old staples. Among these may be mentioned the Rohan potato, Petit Gulf cotton, Mediterranean and Russian wheats, alfalfa, and several varieties of clover. Some of these were failures if not frauds; others proved additions of the greatest economic significance.⁷

⁶ Prior to 1862, promotion of the interests of agriculture by the Federal Government was carried on by an office within the United States Patent Office. In that year President Lincoln approved the establishment of a new office, that of the Commissioner of Agriculture, which became a federal Department in 1889. See T. Swann Harding, *Some Landmarks in the History of the Department of Agriculture*. Washington, D. C.: U. S. Department of Agriculture, Agricultural History Series No. 2, 1942.

⁷ For an interesting account of speculative fads in agriculture prior to the War Between the States, see Arthur H. Cole, "Agricultural Craze, a Neglected Chapter in American Economic History," *American Economic Review*, Vol. XVI, 1926, pp. 622-639. For factual accounts of plant and animal improvement work, see: Carleton R. Ball, "The History of American Wheat Improvement," *Agricultural History*, Vol. IV (1930), pp. 48-71; Charles T. Leavitt, "Attempts to Improve Cattle Breeds in the United States, 1790-1860," *Agricultural History*, Vol. VII (1933), pp. 51-67; E. Parmelee Prentice, *American Dairy Cattle, Their Past and Future* (New York:

The period 1820-1850, which witnessed so much experimental activity with new plants and animals and during which artificial fertilizers came into use, did not neglect the improvement of tools and the possibilities of mechanizing agricultural operations. Indeed, these years were a period of remarkable inventive activity in the field of agricultural implements.⁸ Prior to 1820 a small sum invested in a few hand tools completed the equipment needed to operate a farm. Included were a hoe, rake, axe, scythe, sickle, flail, and perhaps a plow.⁹ Most of these in the early nineteenth century differed little in appearance and effectiveness from their prehistoric prototypes. The years from 1820 to 1860 were years of transition to an era when the capital required in farm operation came to be measured by hundreds of dollars, when the farmer in order to carry on his work efficiently had to have, in addition to the simple tools, such machines as drills, planters, reapers, mowers, horse rakes, threshers, feed grinders, and plows and cultivators of many descriptions. Each one of these was the product of the nineteenth century either in origin or in practical perfection. Some of these implements performed new tasks; some of them performed old tasks better; some of them lightened labor; some of them displaced labor. The new implements were made of iron and steel instead of wood; the tools were highly perfected; the machines brought to bear upon agricultural tasks a degree of nonhuman power previously unknown and hitherto unattainable. They also increased the tempo of operations, as is evidenced by the fact that the horse gradually displaced the slower-moving ox as the draft animal. As a group, these innovations inaugurated the modern age of agricultural technology. By 1880 the foundations for a mechanized farming economy had been securely laid. The agriculture of the twentieth century is more highly advanced in its reliance upon artificial power and the more common use of steel, but it is based upon the machinery introduced, perfected, and brought into common use in the nineteenth century.

It is with these developments in agricultural machinery that the major portion of this chapter will concern itself. This can be done most easily by ignoring chronological sequence and focusing attention instead upon the methods by which the various tasks of the farmer were performed.

Harper & Brothers, 1942); Knowles A. Ryerson, "History and Significance of the Foreign Plant Introduction Work of the United States Department of Agriculture," *Agricultural History*, Vol. VII (1933), pp. 110-120.

⁸ The factual record is to be found in James T. Allen, *Digest of Agricultural Implements Patented in the United States from 1789 to July, 1881* (New York: 1886), and in Robert L. Ardrey, *American Agricultural Implements, A Review of Invention and Development in the Agricultural Implement Industry of the United States* (Chicago: 1894).

⁹ Colonists sent to Virginia by the London Company were equipped with a box of tools for each family of six members. Along with axes and building tools were included five broad and five narrow hoes, three shovels, and two spades. No plows were sent.

These tasks fall conveniently into five groups: preparing the soil, seeding, cultivating the immature plants, harvesting, and preparing harvested crops for market.

Soil Preparation and Cultivation

The evolution of the plow

The implements used to prepare the soil for seeding in the period preceding 1820 included the hoe, a simple shovel plow, and various forms of wooden plows.¹⁰ Complete dependence upon the hoe in soil preparation was by no means unknown in these years; indeed, plows were very scarce in the early years of settlement. In parts of the cotton- and tobacco-growing South, the hoe was the basic and in some areas the only agricultural implement in use at the beginning of the nineteenth century, a condition that persisted in some regions until the War Between the States. The shovel plow in various forms was the most common type of plow in the Middle States and in the South. The working part of this implement consisted of a V-shaped piece of iron with wings sloping backward, not unlike a modern cultivator shovel. This was pulled through the soil by a beam equipped with one or two handles. It had no moldboard, and consequently it did not turn over the soil but merely stirred the surface to a depth of two or three inches.

The plow used in the North was generally constructed entirely of wood save for the "share," which was of wrought iron and similar materials. It varied considerably in details, since it was usually made by the farmer or the local millwright with the help of the village blacksmith. When possible, a farmer possessed two of these implements: a large, heavy plow that was used with two or more yoke of oxen for breaking sod, and a lighter form used for plowing clear land, cross plowing, covering seed, and similar tasks including most of the work later assigned to harrows and cultivators. Among the wooden moldboard plows were several types that were well standardized.¹¹ Compared to later models, all the "improved plows" were heavy, clumsy, and inefficient and, although their performance was distinctly superior to that of the shovel plow, they were unable to penetrate the soil deeply, succeeding in only partially turning over perhaps four or five inches. The inefficient shape of the moldboard,

¹⁰ Preparing the soil for seeding is, in its simplest form, a process of loosening the top inch or two of the surface, employing a pointed stick or hoe with the purpose of covering the seed. No attempt is made to stir the soil so that the roots may penetrate more easily or deeply, nor to change the physical make-up of the soil so as to promote its fertility. This is "hoe culture," and was the technique used by the American Indian. European agriculture was, in contrast, "plow culture" and involved the use of animals to draw a plow, which stirred up the soil to a depth greater than was possible with the hoe.

¹¹ Among the most important was the Carey plow, which was in use as late as 1840. It was one of the first plows to be manufactured in large quantities on a commercial basis.

the frequent repairs and replacement of parts which the crude construction rendered necessary, and the fact that the cast-iron share required frequent sharpening were other objections to such plows.

The history of the cast-iron plow in the United States begins with an implement patented by Charles Newbold in 1797. It apparently performed satisfactorily but was costly to operate because of the rapid rate of wear of the soft metal, especially since it was cast in a single piece. Newbold's plow failed to win popular acceptance, partially by reason of its cost, but also because a prejudice against the plow appeared based on the claim that the iron poisoned the land and made the weeds grow. Other patents on iron plows followed, most successful of which were those of David Peacock, recorded in 1807 and 1822. The Peacock plows were cast in three pieces, and hence represented a definite advance over the Newbold type. For obscure reasons the prejudice against the cast-iron plow faded away, and the Peacock implements enjoyed quick and wide favor. Their popularity was particularly great in the Middle Atlantic States, where they continued to be used until the eve of the War Between the States.

With cast iron successfully established as a suitable plow material, attention was focused on the task of perfecting the shape of the plow. Jethro Wood in 1819 introduced a cast-iron, three-piece plow of special significance because the shape of its moldboard was based on extensive analysis and experiment to improve performance and lessen draft.¹² In addition, the Wood plow possessed a great advantage in that its three parts were cast from standardized patterns and hence were interchangeable and easily replaceable, while the steel-tipped share wore less rapidly than cast iron. The Wood plows were widely and successfully used during the 1830's and for decades thereafter. Further improvements in the shape of the plow were incorporated in the Eagle plows of Joel Nourse, which were sold during the forties at a rate of from 25,000 to 30,000 annually.

In spite of the fact that very large numbers of the improved implements were manufactured, the extent to which the cast-iron plow displaced the older instruments is difficult to determine accurately. At the time of the War Between the States, the skill of the plowmaker was probably far in advance of the art of plowing, even in the progressive sections of the East. Wooden plows long continued to have defenders, and one-handed wooden plows were reported still on sale and in use along the Hudson River in 1850. On the other hand, the barshare, shovel, and

¹² Thomas Jefferson experimented with the application of mathematical principles to the design of the moldboard. Although his experiments did not result in success, his work was significant in placing plow design upon a scientific basis. Another important political figure who contributed to the development of the plow was Daniel Webster, whose experiments with very large breaking plows attracted wide attention.

other primitive plows had virtually disappeared in the West before the War Between the States. The South, however, lagged in adopting the new instruments. In Virginia the primitive forms of plows were not beginning to give way to the new moldboard plows until the time when the later instruments were being replaced by the cast-iron plow in the North. Farther south, although a few progressive planters used the improved implements, and although large quantities of plows were manufactured in the North for Southern markets, these implements on the whole remained very primitive; a prejudice against cast iron persisted; and plantation-made, wrought-iron shovel plows continued to be standard equipment until after the war. There were, indeed, some areas, particularly in the low coastal regions of Georgia and the Carolinas, where this simple and primitive instrument had not yet at the time of the War Between the States superseded the hoe, which remained the all-purpose agricultural instrument. In the sugar regions of Louisiana, where agricultural methods generally were relatively advanced, "though improved plows, harrows, and cultivators are multiplying . . . the reign of the old hoe is undisturbed," and that instrument remained a "home-made article" weighing three times as much as the hoes manufactured commercially in the North. The fact that the shallow, light soils of the South, once broken, were rarely if ever seeded to grass, but were constantly cultivated in corn and cotton, and the practice of abandoning land after its virgin fertility had been destroyed were factors in the reluctance of the South to adopt the improved instruments. Since plantation profits were determined largely by the amount of fresh land and the number of hands available to pick cotton, capital was invested in these factors, and a minimum was placed in implements. Furthermore, the system of slave labor encouraged the use of simple devices and placed small premium on improved equipment.

After the successful introduction of the cast-iron plow, inventive activity turned largely to efforts to redistribute the plow draft, toward further improvements in the shape of the moldboard, the development of special-purpose plows, and the use of new materials.¹³ Efforts to employ materials other than cast iron in the plow were of particular importance, since that material, although far better than wood, was not completely satisfactory. The soft metal of the shares wore rapidly, a fact that necessitated their frequent sharpening, a task expensive of time and money. Cast iron does not take a high polish, and sticky soils consequently cling to its pitted surface. Although these plows were

¹³ The firm of Ruggles, Nourse and Company, one of the largest commercial plow-makers in the forties and fifties, advertised during those decades that it could supply 150 varieties and sizes of plows. Many of these were merely locally preferred variations of the standard types, and it should be noted that even large firms such as this one continued to advertise throughout the fifties the fact that they operated blacksmith shops that could produce any desired style or size of plow to order.

satisfactory when first used upon the virgin soils of the Mississippi Valley, they soon revealed tendencies to scour poorly, a difficulty that increased as the humus in the soil decreased under continuous cropping. After a few years of cultivation, the performance of these plows in Western soils was only slightly more satisfactory than that of the old wooden types. They rooted the soil, rather than cutting and turning a smooth furrow. Working with them was considered a "sad trial to the patience of the farmers of Illinois and Indiana."

A plow adapted to Western soils was, by 1830, well recognized as an absolute necessity. The importance of the problem to the West was recognized by a Vermont blacksmith, John Deere, who had emigrated and settled in Grand Detour, Illinois, where he carried on his trade. In 1838, within a year after settlement, working independently, Deere made three plows equipped with wrought-iron landsides and standards but with the moldboards and shares of sheet iron cut from old saws and bent to shape.¹⁴ The following year he made ten of these improved plows, and thereafter he increased production annually. What was needed, however, was something better than the old wooden plow with a steel-covered moldboard. In 1847 Deere produced the first all-steel plow. It was an instrument far superior to any of its predecessors and had a draft in Illinois soils only half that of cast-iron instruments. The plow was an immediate success. To meet the demand for it, Deere required high-grade steel in larger quantities than could be supplied here. He obtained his needs at first from England, but his demand led to the first production of plow steels in this country in Pittsburgh. To secure access both to his market and to raw materials, Deere established his plow works at Moline, Illinois. There in 1850 he manufactured 1,600 plows. Ten years later his works had reached an annual output of 10,000 units. By that time the steel plow had become standard throughout the West, although, because of its relatively high cost, which was from two to two and a half times that of cast iron, it did not entirely displace the latter. The steel plow remained a Western implement until after the War Between the States. Its advantages along the Atlantic Coast and in the South were unimportant in comparison with its expensiveness and comparative fragility in rocky soil.

Experiments meanwhile went forward to improve the wearing and scouring qualities of the cast-iron implement by hardening the metal and also by combining it with steel. The former objective was achieved in 1870 with the introduction of the chilled-iron Oliver plow. This implement was immediately successful, particularly in the East. More than 175,000 of these plows were in use by 1878. The second approach to

¹⁴ In 1833 John Lane discovered that steel would scour in the sticky soil, and made a plow with a share cut from an old saw blade. He apparently did not attach great significance to his discovery.

this problem appeared as a plow made of soft-center steel, which consisted of a layer of soft iron between two layers of steel. This plow was introduced in 1868 by a son of the John Lane mentioned above. The combination made a moldboard that would not warp, had greater strength than the all-steel plow, was more durable and less fragile, and that scoured perfectly under almost any conditions. After 1870, with the development of cheaper supplies of steel, cast iron was abandoned as a plow metal, although chilled iron and soft-center steel continued to be used for the best plows.

Improvements were made also in the design of plowing implements. With the walking plow highly perfected, attention turned to the problem of creating a gang plow, composed of two or more plow bottoms operating together. A practical form was introduced in 1864, but such plows did not come into wide use until the seventies, and then on a large scale only in California. Sulky plows, which were advocated as making possible the employment of persons who were not able to operate an ordinary plow, likewise did not appear on a large scale until 1864. Introduced in Illinois, they attained a quick popularity in California and were in general use throughout the Middle West by 1880.

Harrows

Seed-bed preparation was sometimes limited to a single plowing, but the more typical practice was a second cross-plowing at right angles to the first. Not infrequently ground was plowed three times or even more when necessary. In many areas these plowing operations completed the task of preparing a seed bed, but usually a more thorough job of pulverization of the soil was highly desirable. Until the War Between the States three types of harrows were used for this purpose. Most primitive was the brush harrow made simply of tree branches or of a number of small trees, such as cedars, which were dragged across a plowed field. Its usefulness was obviously limited. The toothed harrows were more effective. These were of two types: the triangular, frequently hinged in the middle, which was used for new land since it could easily avoid obstacles such as stumps and rocks; and the square type used on old land. They had straight, immovable spikes, sometimes of wood, preferably of iron, and rarely of steel. Although reasonably satisfactory on well-worked land and for light work such as covering sown wheat, these were fragile instruments of limited effectiveness. They were of particularly slight value on sward where the farmer had to plow repeatedly to secure the desired results.

The problems of pulverizing the seed bed were greatly diminished with the introduction after the War Between the States of the disc harrow and spring-tooth harrow. The latter, it should be noted, required steel, which was not cheaply available until the Bessemer process came into

use. A practical steel spring-tooth harrow appeared about 1877 and was being generally adopted by 1880. In contrast to all drag harrows, however, was the concept of a rotary spade or a rotary harrow, which stimulated much inventive activity for 50 years. It was not until the eighties, however, that the first practical application of discs to soil culture appeared in the form of a disc harrow.

Cultivators

Prior to 1820 or 1830 little distinction was made between plowing and cultivating instruments; thereafter cultivation developed as specialized forms of the shovel plow and other simple types of plows were introduced. The shovel plow was not only the most commonly used instrument for crop cultivation but was the most constantly and extensively used of all agricultural implements. After being used for the principal plowing, it was employed to check off the rows for corn or cotton, after which it was used to cover the seed dropped by hand or the grains sown broadcast. Later it was used to cultivate the crop.

This all-purpose instrument gave way to more specialized implements in the North and West as they developed during the thirties and forties. In the East a one-horse cultivator had been introduced about 1820 and achieved some success, although it displaced the shovel plow only slowly. The mass of the farmers knew nothing of cultivators in 1830. In the forties a form of cultivator known as a "gang plow," with two or more light shovels, had appeared, and by 1865 it was said that "such implements are known and employed by all." The five- or six-tooth cultivator made of iron replaced the shovel plow in the forties and by the fifties had become important in the East and the older sections of the West. It was in turn being displaced in the fifties by the more satisfactory steel-tooth cultivator. In the West hoeing had always been reduced to an absolute minimum, and by 1850 the cultivator was in common use there. After 1856 a two-shovel, two-wheel sulky corn cultivator was introduced. In the South, cultivation of corn, cotton, and similar "clean" crops was commonly carried on by hand hoeing, sometimes with the assistance of the one-horse shovel plow. After 1840, however, specialized cultivating implements considerably reduced the amount of hand hoeing required. Among these were the cotton sweep, the skimmer, and the scraper. These were light, double-moldboard plows, differing chiefly in the direction in which they turned the soil.

The efficiency of the new plow

It is difficult to assess the importance of the development of the plow in quantitative terms because of the higher quality of the work done by the improved implements. Unquestionably the new instruments increased the acreage that could be worked in a given period of time.

The old wooden plow generally required two men and four oxen to plow an acre per day; the cast-iron instrument plowed from one to one and one-half acres in the same time but required only one man and only one yoke of oxen or a team of horses to operate it. The steel plows and likewise the gang and sulky plows also increased productivity. Aside from increasing the rate at which plowing was done the new implements enabled a far more effective job to be performed. In fact, the development of the plow compensated in a considerable degree for the destructive exploitation of the soil which resulted from the agricultural methods currently employed. In the period of first settlement the poor quality of the work done by the available plows was not particularly serious since the pulverization of the soil was not an essential requirement in new soils. Early inventors such as Jethro Wood were not primarily concerned with the manner in which plows operated; they were interested rather in reducing the effort required, because newly cleared soils are full of humus and thus fall apart very easily. Also the presence of humus tends to make for fertility, and hence such soils did not require deep stirring to make them productive. But the decrease in the amount of vegetable matter after long cultivation tended to make the soil clod easily when plowed. The decrease in fertility likewise required a more complete mixture of the soil elements if productivity was to be maintained; hence the need for more efficient implements. The ability of American agriculture to secure sustained production for long periods from the same soil, despite decreasing intrinsic fertility and the reluctance with which American farmers turned to fertilization and crop rotation, was in part a result of the increased efficiency of the plow.

Seeding

Prior to 1840 the small grains were everywhere sown by the broadcast method; seed was scattered by hand and covered with soil by plows and harrows. Cotton was sown in rows by hand and covered by the plow; corn was dropped in checkrows by hand and covered by the foot or plow. In Great Britain the broadcast method of sowing grains and other field crops had long been displaced by the use of the seed drill, which cut a straight shallow furrow, deposited a predetermined amount of seed, and then covered it with earth. There was, however, little place for a machine such as the drill in the primitive agriculture of the early American settlement. The English drills were of no value in planting corn, the chief American crop, since they could not plant in the equally spaced hills which were considered necessary to the successful cultivation of this plant. Moreover, it was common practice to sow winter wheat directly in the corn stubble, harrowing it into the soil. The seed drill was useless in the debris-covered soil, even though such

seeding was sometimes preceded by a shallow plowing. The presence of stumps in American land, the hilly and stony nature of much soil in the East, and the lack of capital with which to purchase the seed drills, all militated against their use. Furthermore, the successful employment of the drill required greater care in the plowing of the field than was customarily exercised. Fine preparation of the soil did not conform to the typical American practice of cultivating the maximum possible acreage and disregarding the quality of the work nor was it possible until farms had progressed out of the pioneer, farmmaking stage. Moreover, broadcast sowing was reasonably successful, and the task of sowing small grains was not a serious drain upon either the time or energies of the farmer.

The improved plows and harrows available by the forties made a well-prepared seed bed over a large area economically possible. The older wheat-producing sections, well beyond the farmmaking stage, were experiencing a decline in wheat yields. The wheat-growing areas were, moreover, moving to the smooth, clear grasslands of the West, and these regions likewise felt declining yields after some ten years of cultivation. At the same time, the European markets for wheat became increasingly attractive. All these factors called attention to any method that would increase yields, decrease the loss of winter wheat by winterkilling, and save seed.¹⁵

English drills had found their way into this country in the eighteenth century, and an American patent for a drill had been issued as early as 1799. There is, however, no evidence that these found any extensive use. Drill culture in this country was adopted for the first time on a permanent basis in the early 1840's in eastern Pennsylvania and Delaware. In 1841 Samuel Pennock introduced his improved drill, which he soon after brought into commercial manufacture. The Pennock machine had seven hoes equipped for gravity feed of the seed. Any of the small grains, as well as corn and peas, could be sown by it in a covered furrow. Numerous improvements followed; the machines were equipped with slide and force feeds and also with shoes which worked well in rough, debris-covered soil.

These drills were quickly adopted in wheat farming. By 1850 their use had spread from Delaware south into the wheat areas of Virginia and Maryland, west into Pennsylvania, and north into the wheat regions of New York. As the agriculture of the Mississippi Valley passed out of the farmmaking stage, the drill appeared there also. The machines were in use in Ohio by the late forties, common in the late fifties, and familiar throughout the wheat areas of the Midwest prior to the War

¹⁵ Economy in seed was important, since an acre which might yield on an average of from 10 to 20 bushels required from 2 to 2½ bushels of seed if sown broadcast, but only half that amount if it were drilled.

Between the States. During the 1870's the drilling of wheat spread rapidly in the Middle States and became standard practice in the following decade. The decline of wheat growing in New England during this period prevented any widespread adoption of the drill in that area.

In the South cottonseed was generally planted by hand, although mechanical "planters," drills modified for this purpose, were available and in wide use by 1860. A "planter" operated by one man could do as much work as four men and two mules in hand planting; it also economized on seed, which was, however, rarely an important consideration. Cotton was generally planted in rows and thinned by hoeing after the plants were established. Corn, in contrast, was planted in hills which had to be accurately located so that the crop might be cultivated in both directions. For this purpose the early drills were of no value, but a corn planter that gave the operator direct control over the dropping of the seed, placed on the market by George Brown in 1853, partially solved the problem. Brown's machine could plant 15 to 20 acres per day if the area had previously been marked by cross-plowing. This corn planter came rapidly into use during the fifties, and by the end of the next decade a large part of the corn acreage of the West was being planted by machines such as Brown's. In 1857 a machine that dropped the seed automatically in checkrows was patented by M. Robins of Cincinnati. The dropping mechanism of this apparatus was operated by a notched wire stretched across the field, and dispensed with the man formerly required to do this work. This planter was perfected by other inventors; it came to be called the "checkrower," and was introduced and manufactured in a successful form about 1877 by the Haworth brothers.

Harvesting

Early methods

The ultimate benefit of improvements in plowing, cultivating, and planting implements depends upon the degree of development of those implements useful to the farmer in harvesting. In the case of most crops the labor of harvesting is, of all agricultural tasks, the most arduous as well as the most crucial. The capacity to harvest has been and still remains the bottleneck of agricultural production; the labor the farmer is able to apply at harvest time determines his product for the season, particularly in the case of wheat, of the small grains generally, and of hay, cotton, and tobacco. Because of the longer harvesting season, the problem was less acute or even nonexistent in the case of corn. The inventions of the nineteenth century contributed immeasurably to increasing the productivity of labor in harvesting.

At the beginning of the nineteenth century the harvesting of hay and

of the small-grain crops presented the greatest problems because of the slow and difficult work of reaping, mowing, and raking, because of the brief period during which these crops are ripe and must be harvested, and because of the danger of loss from untimely rains. The primitive method of harvesting the grass crops was by sickle, or scythe, and rake; that of the small grains, by sickle, or cradle, rake, and hand binding. The first advance in wheat harvesting was the introduction of the cradle, a heavy form of scythe with fingers parallel to the blade to hold the cut grain. Although probably European in origin, the cradle found earlier and more extensive use here than abroad. It was employed in this country as early as 1769 and found considerable favor as a labor-saving device in parts of the wheat sections of Virginia and Maryland. Its use was restricted, however, because of the heavy work it entailed and the difficulty of employing it in a heavy stand of grain, and because the kernels were shattered when the grain was excessively ripe. For these reasons, up until about 1830 the sickle continued to be the more widely used implement.

Reapers and harvesters

The concept of a mechanical device to mow and reap is European and very old. Nevertheless, such implements were first brought to mechanical practicability, to popular utilization, and to large-scale commercial manufacture in the United States. The period of successful and useful reapers began in 1831, when Obed Hussey of Maryland patented the first successful machine. Cyrus H. McCormick, a Virginian, patented another reaper in 1834, and these two pioneers were succeeded by numerous other inventors and imitators. The Hussey reaper was a two-wheel mower not very different from the modern machine except that the cutting bar was placed to the rear of the drive wheels instead of at the side. The cut grain fell upon a platform that extended the width of the reaper, and from there it was raked by a man who rode on the machine. The original McCormick machine was superior to the Hussey in that it had a reel that forced the grain against the cutter bar and dropped it on the platform. On the other hand, it had an inferior cutter bar,¹⁶ and the raking operation was more difficult since no provision was made to carry the man required to perform this task. After 1845 a raker's seat was added to the McCormick reaper, and later an improved cutter bar of the Hussey type was added.

Reapers equipped with mechanical rakers appeared on the market in

¹⁶ The Hussey machine was equipped with a cutter bar with pointed blades attached which vibrated through slots in iron fingers, producing a clipping or chopping action. McCormick's was also a vibrating cutter bar but had a serrated-edge knife instead of the pointed sections and produced a sawing action. By 1856 the cutter bar had been perfected as a flexible bar with smooth-edged, rapidly reciprocating blades.

1854. Such machines were perfected about 1861 and became the most popular type of reaper for the next 15 years. The "self-raker" cut the grain, raked it from the platform and dropped it on the ground in sheaves that could be easily picked up by hand to be bound and shocked. A machine rendering the binding task much easier was the next development. This was the Marsh harvester, which carried a platform upon which two or three men rode, binding the grain as it was raked from the cutters. The machine was on the market after 1864, although it was not until a decade later that it was perfected, produced in large numbers, and widely adopted. By 1879 some 100,000 machines of this type were in use.

Although the Marsh harvester lightened the burden of binding, the application of mechanical devices to this task continued to be a great and unsatisfied need. Patents on binding mechanisms had been granted as early as 1850 although none had proved practicable. Meanwhile, William Deering, a New England textile merchant, took over the manufacturing rights of the Marsh harvester and established a plant at Plano, Illinois. In the early seventies he undertook the manufacture of a binding device that employed wire and that he successfully attached to the harvester. This was the first machine to perform all the tasks of reaping mechanically. Commercial manufacture of these machines commenced immediately, some 20,000 of them being in use by 1878. The wire used in the binder was, however, a dangerous nuisance in the fields and also in the flour mills. In fact, millers threatened to discriminate in price against wheat so harvested, since small pieces of wire present in it damaged their machinery. Meanwhile, Deering revived the idea of binding by using twine. A patent on this method had been issued to John E. Hewitt as early as 1850, but Deering employed the Appleby binding mechanism, which had been patented in 1873. The difficulty of obtaining a proper twine almost resulted in failure of the experiments. By 1880, however, a Marsh type of harvester equipped with the Appleby binder and using twine had been placed on the market as the Deering harvester. Within a few years all other forms of reapers had been rendered obsolete.

One other form of harvester merits attention. Probably the oldest method of mechanical harvesting, dating back to Roman times, was that of the "header," which cut the head of the grain only, leaving the straw standing in the field. "Headers" had been perfected, particularly by George Easterly, and were on the American market, but did not enjoy great popularity. A portable machine combining header, thresher, and cleaner was invented in Michigan in 1835 and was sufficiently perfected to perform satisfactorily in 1853. Heading followed by immediate threshing requires that the grain be drier than is normally the case in the Middle West. The machine was consequently removed to California,

where it was successfully operated in the harvests of 1854 and 1855. This was the first successful "combine." This particular machine was destroyed by fire, but experiments continued, culminating in 1878 when the "combine" reappeared in perfected form. Thereafter it was rapidly adopted in the dry wheat regions.

Although Hussey's machines were introduced into actual service by 1837, they were not sufficiently perfect to merit popular adoption. Hussey was not a successful promoter; he failed to incorporate the improvements of others in his machine, and hence he did not succeed in producing or selling his machine in large numbers. McCormick, on the other hand, proved to be an astute businessman as well as an inventor. By 1844 McCormick had developed his implement to the point where it was practicable and merchantable, even though still crude. Thereafter he undertook aggressive promotion. Although he at first employed the production method, common at the time, of giving manufacturing and sales rights in various territories to other firms, he soon discarded this policy to concentrate the production of his reaper in his own plant established in Chicago. From then on, although he made improvements in his machine each year, he gradually turned his technical and production problems over to his two brothers and devoted his own energies to broadening his markets. Although the reaper was the product of many minds, both in its origins and in the perfection of its details, the credit for placing the machine in the hands of the public in large numbers, in constantly improved form, and upon favorable terms belongs to Cyrus H. McCormick.

The adoption of the reaper did not wait upon its ultimate perfection. Crude though the early machines might be, they were to a progressive farmer far better than the cradle or the scythe. Harvesting by the early machines was only slightly cheaper than hand labor; yet the economy was less important than the fact that they increased harvesting capacity. By increasing the productivity of harvest labor, the reaper made it possible for a farmer to reap approximately as much wheat as he could sow. In 1845 reapers were coming into use in small numbers in the East. In 1849 probably some 2,800 McCormicks and perhaps 300 other makes were in the hands of farmers. Thereafter sales mounted steadily. Popular adoption of the machines began about 1855, the date when the first satisfactory McCormick was produced. In that year some 15,000 machines valued at about \$2,000,000 were manufactured and sold, with the demand exceeding the ability of the manufacturers to supply. Twenty thousand of the machines were said to have been used in the 1856 harvest in Illinois alone, and McCormick estimated in 1858 that 73,000 reapers were in operation west of the Alleghenies. Adoption after 1858 was at an accelerated rate. Probably 100,000 were in use by 1860, and during the War Between the States some 250,000

additional machines were placed in operation.¹⁷ In the early seventies, 125,000 of the machines were sold annually.

To cut, bind, and shock from one-half to three-quarters of an acre of good wheat was an average day's work with the sickle. A cradler could cut approximately two acres in the same time, but the grain had yet to be raked, bound, and shocked. One binder following each cradler was the minimum; more generally, three binders were required to follow two cradlers so that the output with this implement was actually one acre or less per man. The productivity of the cradle was thus little greater than that of the sickle although the occasional employment of women in binding did increase the labor force available for the task. The early Hussey and McCormick reapers cut from 12 to 15 acres per 10-hour day. The reaping machine was thus equivalent to four or five cradlers. There was also a saving in binding since the reapers laid the grain in gavels instead of in swaths, and the work was thus rendered easier. Four to six binders—but generally five—were employed behind each reaper so that a saving of some five men was made by the reaper and of six men by the self-raker over the sickle. The harvester still further reduced the labor required, since only two or three binders were necessary, and thus only four men were needed to harvest 10 or more acres per day. It was the self-binder, however, which, more than any other implement, did away with extensive labor in wheat production. The machine dispensed with human binders; by its use one man could manage a wheat harvest at the same rate that previously had required from 15 to 20 men working with the sickle. The "combine" was even more efficient; about 1880 it reaped and threshed grain at the rate of nine or more acres per day.

Harvest wages were always high and harvest labor always scarce in the wheat and hay fields. The period of rapid adoption of the reaper began about 1855 but was greatly accelerated during the sixties, coinciding with the War Between the States. Although the scarcity of labor during the war no doubt stimulated the sale of reapers, the satisfactory quality of the machines then becoming available must be considered the determining factor in their rapid acceptance. It is probable that the harvester would have been adopted as rapidly as practicable machines could be supplied. The profitability of producing wheat was determined largely by the state of the European market. Once a reliable, practicable machine was available, the economy of its use was self-evident, and lack of capital was no great obstacle for, although the machines were expensive, they were always sold on credit, and one good harvest not infrequently returned the investment. The North, however, was

¹⁷ About 104,000 machines were produced by 187 establishments in 1864, of which two-thirds were reapers and the remainder mowers.

fortunate that a machine became available which enabled it to maintain and even increase wheat production at a time when a large part of its manpower was drawn off into its armies.

Mowers

The early harvesting machines were intended to be both reapers and mowers; indeed, until the eighties one of the specifications considered essential for a satisfactory harvesting machine was that it be quickly interchangeable to cut either grain or grass. The problems of mowing are, however, dissimilar to those of reaping, and the perfection of a machine that would do close and economical mowing required that the two functions be distinguished. Close cutting, although important in a reaper, was essential in a mower; it was nearly impossible with the type of machines that were manufactured. The first definite distinction between the two objectives was made in 1854, when the Ketchum mower was patented. Improvements that appeared within a few years made this a practicable machine, and the perfected mowers such as the Kirby and the Buckeye were well established by 1860 in a form essentially like the present one. The combined reaper-mower continued to be the most popular form until the eighties when the development of the complex binder-harvester made such dual-purpose machines no longer practicable.

Although hay was still mostly cut by scythe in 1840, it was very generally raked by the "revolver," a horse-operated, wheelless rake consisting of two sets of wooden teeth set on opposite sides of a wooden shaft. While being drawn along the ground, the hay was gathered in front of the rake until it was filled; then a slight twist would revolve the instrument, emptying the filled set of teeth and bringing the other into raking position. This instrument came into use about 1825-1830 and continued to be employed throughout the fifties. It seems to have been in use wherever hay was an important crop, particularly in New England. There it was considered more essential than mowing machinery, since raking was more dependent upon the weather than was mowing. Progressive farmers early in the fifties were turning to a two-wheeled rake equipped with wire teeth. This was very successful, working well on rough and stony ground. It came into use rapidly after 1853. It was estimated that this rake did the work of from eight to ten men, whereas the "revolver" was capable of doing the work of about six men equipped with hand rakes.

Attempts were also made to develop mechanical devices to harvest other crops. A cotton picker was patented as early as the fifties. It was unsuccessful, as have been the hundreds of subsequent efforts. Experiments with the mechanical harvesting of corn began as early as 1820. These early machines were patterned largely after the grass

mower and the grain reaper and were unsuccessful. The first important patent on a corn harvester was issued in 1880 to E. W. Quincy of Illinois whose machine was intended to pick the ears of corn from the stalks standing in the field.

Preparation for Market

The cotton gin

Many crops require further preparation on the farm after harvesting so that they can be stored, transported, and fitted to market requirements. Tobacco must be cured; corn, shelled or converted into pork; hay, baled or converted into milk and beef; grain must be threshed and cleaned; cotton, ginned and baled. Particularly important technological advances were made prior to 1880 in the solution of two of the most serious of these preparation problems: the ginning of cotton and the threshing of small grains.

A large part of the weight of picked cotton bolls is contributed by the seed, to which the fiber adheres tenaciously. Removing this seed is a difficult, laborious process. It requires a day for a man to clean from one to a maximum of six pounds of the fiber from its seed, depending upon the variety and the length of the staple. This problem was the bottleneck in Colonial production of cotton. The cost of the cleaning operation was such that cotton remained a luxury textile higher in price than other available fibers.

In the Colonial period a simple machine, the roller mill, had been introduced from East India into the Sea Island cotton areas. This machine added little to a man's productivity in the short staple cottons, but it proved valuable in the long staple fibers, increasing the production of clean cotton to as much as 25 pounds per man per day. Indeed, the introduction of the roller mill was responsible for reducing the cost of cotton to the point where it displaced linen as the common textile fiber in the South. Cotton remained too costly, however, to find general use. Yet, at the same time that the South was in need of a crop more profitable than tobacco, the development of textile machinery in England, following the numerous inventions of the last half of the eighteenth century, brought higher prices and a greater demand for cotton.

It was upon this scene that Eli Whitney in 1793 introduced his "saw" gin, which solved the problem of separating the seed and fiber. Because his device was simple and could be easily and cheaply reproduced, it met with a degree of immediate success accorded to few other inventions. The machine consisted essentially of two cylinders.¹⁸ One

¹⁸ The roller mill consisted of two wooden rollers which revolved against each other, but lacked any device to pull the fiber from the seed.

was equipped with teeth that entered a hopper containing the seed cotton, the teeth pulling the fiber through holes in a screen too small to permit the passage of the seed. The fiber was then removed by brushes on the second cylinder, which rotated in the opposite direction and at a greater speed. Whitney's original gin produced about 50 pounds of clean cotton per day. Improvements by others resulted in the development of the more complex "huller" gin, which increased the amount of dirt and trash removed, reduced injury to the fiber, and increased the product. Horsepower was also used in operating it. By 1845-1850 the average daily product of a gin employing three hands and representing an investment of \$75 or \$100 was from 600 to 2,500 pounds of cotton. Gins remained largely horse-operated, plantation machines until the War Between the States, but thereafter steam-powered gins came into use, and ginning tended to become a service industry operated on a fee basis, instead of a farm task.

The cotton gin, more than most new machines, was the product of one man's inventive skill. It was the first important agricultural invention produced in this country, and its significance in the development of American economic life is second to that of no other technological innovation. Because it made the production of cheap cotton profitable, the cotton gin, along with the inventions within the textile industry in England, helped to fasten the plantation system and slavery upon the South. The more fundamental significance of the gin lies in the fact that, combined with these other textile innovations, it made possible the cheapest source of clothing materials which the world has since enjoyed.

Threshing

Preparing harvested small grains for market requires that they be threshed to loosen the kernel from the head, that the grain be separated from the straw and chaff, and that the grain be winnowed to clean it of chaff and dust. The threshing methods brought to this country from Europe were the age-old flail and treading floor. Where the flail was used, as in New England, threshing was an occupation which consumed many winter days since one man could thresh only about seven bushels of wheat or as much as eighteen bushels of oats per day. Treading was the method almost universally used in Maryland, Virginia, and the South and was widely employed in the Middle States and the West. Oxen or preferably horses were driven over the grain, which was laid on wooden floors in barns or on fields of hard-packed or frozen earth. An early American innovation, the use of a heavy wooden roller equipped with numerous long pegs that was drawn by the horses over the grain, increased production by as much as 100 per cent. Treading was a less laborious and more expedient method of threshing than flailing, but it required more care in the preparation of the floor and the possession

of an adequate number of animals; moreover, it yielded a lower-quality product.

After the grain was threshed by either of these methods, the straw was raked aside, the grain gathered and cleaned of its dust, dirt, and chaff by winnowing. The crudest method of winnowing was that of tossing the grain into the air on a windy day so that the light dust and chaff were blown away. The more common method employed a sheet, the flapping of which produced a breeze which blew away the chaff as the wheat was passed through a sieve or was shoveled into the air. These two methods prevailed in the United States until about 1800. Winnowing was the first threshing operation to be mechanized. Simple, hand-operated fans designed to blow a current of air through the grain as it was fed through a hopper were imported from England and were in use by 1770. Domestically manufactured mills came into use rapidly after 1800 and were standard by 1820 or 1830.

Machines that would loosen the grain kernel from the straw had been invented in the latter half of the eighteenth century in Great Britain. Some of these threshing machines found their way to the United States, but they did not prove successful here, nor did a thresher that in 1791 was the subject of the seventh patent to be granted in this country. The need for some device to lighten the arduous tasks of threshing and to increase the quality of the grain that could be placed on the profitable European market led to considerable inventive activity in the twenties. Numerous machines were introduced and some of them, although very imperfect, came into popular use. The most successful form was the "ground-hog" thresher, which consisted essentially of an open cylinder and concave equipped with spikes and teeth. The grain was passed into the cylinder where it was beaten by the rapidly revolving spikes and thus dislodged from the kernel.

Credit for the first permanently successful American thresher belongs to Hiram and John Pitts of Maine, who introduced their machine in 1837. The early Pitts machine was not so much a new contribution as it was a combination of the standard fanning mill and the established "ground-hog" thresher. Moreover, the Pitts machine was portable. With the addition a few years later of an endless apron separator that removed by vibration the grain not removed in the concave, the Pitts machine became the prototype of all other threshers. The problem of disposing of the straw continued for some time to be a difficulty, but it was solved with the addition of an elevator stacking device which was in common use in 1860.

These early threshing machines were powered sometimes by water, but more frequently by large stationary sweeps operated by horses or oxen. Hand power was quite inadequate, although at least a few of the early machines were intended to be crank-operated. The introduction

of the endless belt or railway power, operated by horses, represented a distinct advance and made possible portable threshers.¹⁹ It was, indeed, in working on the perfection of such a power that the Pitts brothers' attention was so successfully turned to the thresher. The application of steam power to operating threshers was, however, almost immediately successful, and it was here that agriculture first benefited directly from the development of artificial power. The railway power was from 1830 until after the War Between the States the common source of power for threshing machines as well as other agricultural machinery such as grinding and cutting mills. A large sweep was also in use with the larger type of thresher. The application of steam to agricultural operations attracted much attention after 1850. Early experiments sought to apply steam power to plowing with little success. The portable steam engine began coming into use in threshing after 1869. Within a decade it had almost completely displaced horsepower.

Crude though the early devices were, threshing by machine appears to have begun to supersede other methods as early as 1830. After the introduction of the Pitts apparatus, mechanical threshing became the standard method wherever wheat was grown on a commercial scale, widely so in the forties and universally before the War Between the States. The smaller threshers were generally owned by farmers who did their own work, whereas the larger, more efficient machines required more capital and large crews to operate them. As these came into use, threshing tended to be performed on contract by itinerant threshermen who supplied their own equipment. In Illinois threshing on contract was common as early as 1846 and was general in the fifties. In New York in 1855 very few farmers owned their own machines but depended upon itinerant threshermen. By 1860 this was everywhere the most common arrangement.

Working with a flail and winnowing with a sheet a man could thresh from five to eight bushels of wheat per day, depending in large part upon the quality of the grain. Five to six bushels were probably the usual product early in the century. The fanning mill had a productivity of some 100 or more bushels per day and increased threshing productivity as a whole slightly. Where treading was the method employed, the product was about 15 bushels per man. The early threshing machines had a capacity of about 50 bushels per day. Merchant threshers such as were in use in the fifties employed five men and two horses. The product of such a combination varied considerably, ranging from a low of 20 bushels per man to as much as 100 bushels. Perhaps 30 bushels per man per day can be taken as representative under good conditions.

¹⁹ A *horsepower*, as the term was commonly used prior to 1880, was a sweep or treadmill designed to apply animal energy to the operation of stationary machinery.

The machines that became available about the time of the War Between the States increased this figure materially and steam-operated machinery may have doubled the results suggested.

The preceding pages have described the development of agricultural implements from simple, hand-operated tools, made largely of wood, to machines of considerable complexity, employing animal power. Only a part of the story, albeit the most important, has been told. No mention has been made of improvements in such simple tools as axes, shovels, hoes, and forks, nor of the development of such machines as hay and feed cutters, grinders, shellers, hand planters and broadcast seeders, clover seed harvesters, nor the early development of the application of the steam engine to agriculture. Neither has there been any discussion of one particular industrial product of the greatest importance to agriculture—the barbed wire for use in fencing which was invented in the sixties.²⁰

Summary and Conclusions

About 1800 “a clumsy ax, a miserable kicking plow with a wooden moldboard, a wooden-tooth harrow, a coarse shovel, a heavy hoe, an imperfectly tempered scythe and sickle, flail and a hand grain fan were about all the implements that the best farmers then thought necessary for them to possess.” The progress of mechanization up to the 1850’s is well illustrated by the editor of the *Scientific American*, who wrote in 1857 that “every farmer who has a hundred acres of land should have at least the following: a combined reaper and mower, a horse rake, a seed planter, and sower; a thresher and grain cleaner, a portable grist mill, corn-sheller, a horse power, three harrows, a roller, two cultivators, and three plows.”²¹ The total cost of the tools described as adequate for 1800 may be estimated at \$15 or \$20. The investment required by the implements described as necessary in 1857 and which actually were commonly owned within a few decades was many times as much. A reaper-mower cost about \$135; a seed drill, about \$60; a portable thresher, from \$100 to \$200; a sweep or tread mill horsepower, about \$85 to \$150; a gristmill, perhaps \$15 to \$30; while plows, cultivators, and harrows were on the market at from \$5 to \$20 each.²² The new implements were expensive. In view of this fact it is surprising that they were adopted so quickly and in so imperfect a form. This is particularly true when considered in light of the fact that land could

²⁰ See Early W. Hayter, “Barbed Wire Fencing—A Prairie Invention,” *Agricultural History*, Vol. XIII (1939), pp. 189-207.

²¹ *Scientific American*, Vol. XII (1857), p. 292.

²² Shortly before the War Between the States an 80-acre Iowa frontier farm which could be purchased as raw land from the Government for \$100 was described as requiring for profitable operation besides small tools, a breaking plow, a common plow, a reaper, and thresher, representing a minimum investment of \$375.

be purchased from the Federal Government at \$1.25 an acre, that the wages of common labor were less than a dollar a day, of skilled labor, perhaps as much as \$1.25 or \$2.00, that farm hands received from \$100 to \$150 per year, that Eastern farmers considered a year's efforts not unsatisfactory if they made profits of from \$50 to \$100 above their own wages. A low estimate of the cost of the implements necessary to the operation of an average Northern farm was \$500. Before the War Between the States many and perhaps most farms fell short of such outlays in implements but the trend was nevertheless toward heavier investments in mechanical equipment.²³ The importance of implements in Southern agriculture, by way of contrast, changed little between 1800 and 1860, nor did it change significantly before 1880.²⁴ Aside from the introduction of the cotton gin the South benefited little from technological advance. The crops which were important in the South, principally cotton, corn, and tobacco, continued to be produced entirely by hand; harvesting, in particular, was untouched by mechanization. Cotton production per hand did increase, but the reasons were the movement of the cotton region westward, the introduction of the more desirable Mexican variety, and improved methods of cultivation.

The effect upon the ability of an economy to produce is the most important measure of technological advance. In those areas where the mechanical changes already described were adopted, the changes in productivity were great. A man with a two-horse team and equipped

MAN-HOUR REQUIREMENTS IN WHEAT PRODUCTION
(PER ACRE) *

Date	Preparation and Seeding	Harvesting	Threshing	Total
Prior to 1830	26	20	29	75
1850	25	10	8	43
1880	10	2	1	13

* Data given are highly generalized in character and indicate minimum hours required with the use of the best available equipment.

The author is particularly indebted for assistance in preparing this table to Miss Catherine Corson, and for the use of her unpublished manuscript, *Technological Changes in Wheat Production as a Factor Affecting Labor Inputs*.

²³ One important effect of technological progress and mechanization was to increase the capital required to enter upon and conduct agricultural operations efficiently. The result was a decrease in the opportunity for the movement of population from urban industrial wage occupations to rural independent self-employment. See Clarence H. Danhof, "Farm-making Costs and the 'Safety-Valve': 1850-1860," in *Journal of Political Economy*, June 1941, Vol. XLIX, No. 3, pp. 317-359.

²⁴ A South Carolina cotton plantation in the fifties with 2,700 acres in cultivation worked by 254 slaves was equipped with 60 bull-tongue plows, 60 shaving plows, 25 turning plows, 15 drills, and 15 harrows, which with small tools had a total value of \$1,782, slightly over one per cent of the total value of a plantation and the slaves. A 1,100-acre plantation in Alabama valued at \$82,240 listed its tools as worth \$400. A 900-acre Virginia plantation worked by 18 slaves placed a value of only \$425 on its implements of a total valuation of \$20,000. Similar instances might be cited.

with the machines available about 1880 could perform from 12 to 20 times as much work as he could have done by hand. Consequently a greatly expanded acreage could be cultivated in fewer hours and with less human effort. At the beginning of the century, in the wheat-producing areas of Virginia, Maryland, and New York, it required from 65 to 80 hours of work in the various operations from plowing the soil to sacking the grain to produce an acre of wheat, yielding from 15 to 25 bushels. By about 1880 in the same states the employment of the improved plow, drill, binder, and thresher reduced the labor time required to about 24 hours. These states were, however, no longer the primary wheat producers. In Indiana and Illinois the time required had been reduced to as little as 13 hours. Thus, whereas one day of labor at the beginning of the century produced from 3 to 4 bushels of wheat (or 5 if the crop was exceptional), by 1880 the product had been increased to from 10 to 20 bushels, and in certain areas such as California, to as much as 50 bushels. The production of wheat was about 5.5 bushels per capita in 1800 as well as in 1850. But despite the relative decline in the rural population and the decrease in the relative importance of wheat production, the grain produced per capita had increased to 9.1 bushels in 1879.

The technological progress and the economy in labor achieved in wheat production only slightly exceed in importance the less spectacular changes that had taken place in the cultivation of corn. By 1865 every phase of corn production except that of harvesting could be conducted by horse-powered implements and machines. With a wooden plow and a hoe, only a few acres of corn could be cultivated by one man, whereas with an improved iron and steel plow and with horse-operated planters and cultivators a man could care for perhaps 40 or more acres. With hand tools about $4\frac{1}{2}$ hours were required to produce a bushel of corn. The employment of the best implements available in 1880 had made possible a reduction to one-fifth or one-sixth of this time.

The mower and the horse rake had similar effects upon the productivity of labor in the hay-producing areas. To these must be added feed cutters, introduced in the thirties, and mechanical hay loaders, forks, slings, and carriers introduced in the seventies, that made it possible to move hay from field to wagon and wagon to mow or stack by horsepower. By hand methods a ton of hay required 35 or more hours of hand labor; by the methods available in 1880 the labor required had been reduced to one-half or even one-third of that figure. The most difficult task, mowing, had been reduced from 11 hours to less than 2 hours per ton. No longer was the number of cattle to be raised determined by the number of tons of hay that could be mown; the question became one instead of how many cattle could properly be tended and how much hay stored.

The ultimate effect of mechanization was to reduce greatly the proportion of the population that had to devote itself to the production of agricultural products. This fact is illustrated by the change in the distribution of the population. In 1790 94 per cent of the population was rural, living in towns of 2,500 population or less. In 1880 71 per cent of the population was rural. This rural population was able to supply with food not only itself plus the 29 per cent of the urban population but to provide large quantities for export. The difference in these two situations is a rough measure of the increased productivity of mechanized agriculture. Even more important is the fact that the trend in increasing productivity here indicated continued at an accelerated pace. The continued increase in productivity was based in part on continued improvement and perfection of the machines introduced in the first three-quarters of the nineteenth century. Continued advances were based, however, largely on a new factor, the utilization of artificial power in place of animal power.

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CHAPTER 7

Agricultural Organization: A Comparative Analysis, 1789-1860

European Borrowings

THE AMERICAN COLONISTS found temperature, seasons, rainfall, soil, and topography on the Atlantic Coast not very different from the geographic environment they had known in Europe. Forests along the seaboard proved an obstacle, but they were not of tropical jungle growth, and, once cleared, provided open land. Hence it was possible to transfer European crops, livestock, tools, and methods of production to the New World. Wheat, rye, barley, oats, buckwheat, and peas, all of which had been raised in Europe, became important crops. To this list the Indians made the important contribution of Indian corn, as well as tobacco, potatoes, tomatoes, sweet potatoes, peanuts, pumpkins, and squashes.

With minor exceptions, such as the turkey, Europe supplied all the livestock—horses, cattle, sheep, and swine—that were to dominate the farm scene. The tools and implements brought over from Europe were primitive by modern standards: the hoes, spades, scythes, reaping hooks, shovels, carts, harrows, and plows.¹

Colonial farmers were indebted to England not only for crops, livestock, and tools, but also for attitudes and habits that soon assumed the characteristics of the American farm. Although England was predominantly rural in culture at the time when the Colonies were settled, even seventeenth-century England was not highly developed agriculturally. Not more than a quarter of its land was under cultivation and much land lay in open fields. There were few fences and fewer highways, except for cart or bridle paths. The new country to which the Colonists came was much like that of the mother country; hence it was not difficult to adapt English rural practices to Colonial life.²

¹ A complete collection of early Colonial farm tools may be seen in the museum of the Bucks County Historical Society at Doylestown, Pennsylvania. It is interesting that the curator calls attention to the fact that these tools, while modern in make, "are ancient in type." Until power-driven farm machinery began to appear farm tools had remained unchanged for thousands of years.

² William Bradford in *History of Plymouth Plantations*, Boston: Wright and Potter, 1898, reports that the Pilgrims were "used to a plaine countrie life and ye innocent trade of husbandry."

In England private ownership of land was slowly emerging after a long history that had included ownership by families, by communities, under feudal government, and by manorial tenure. While some features of these older institutions were transplanted to North America (quit-rent, entailed estates, and primogeniture) and a few survived for a time in Canada and Mexico, on the whole land cultivation in the Colonies developed under private ownership, a system that became universal in the states after the Revolution.³

The important contribution that European crops, livestock, tools, and methods made to American agriculture is best illustrated by the sharp contrast between Indian and Colonial agricultural practices. At the time of colonization, North America probably contained about 3,000,000 seminaked native inhabitants who were precariously housed and ill fed, and who fought each other for possession of hunting grounds. The Indians in North America understood no private ownership in land, though some practiced sedentary subsistence agriculture. From the outset, the Colonists utilized land, timber, and other resources in ways very different from those the Indians had used. While adopting many Indian practices, notably the growing of Indian corn,⁴ the white settlers soon planted other crops, introduced livestock, utilized ox and horse power, began to harness the waters, made clothing from a variety of material, and built substantial homes. With ideas, information, methods, and technology brought from Europe the new settlers were able to extract from their environment more products and a greater variety of crops than were the Indians. The contrast forcibly illustrates the part technology plays in production. Today, for example, the same American soil, climate, and topography that yield food in abundance for a population of 130,000,000 three centuries ago provided scant fare for 3,000,000 people. Education in methods of production, invention of tools, and use of power have greatly increased productivity. If these skills were lost, society might again revert to a world of hunger.

Modifying Elements

Although climate, soil, and topography north of the Chesapeake were enough like those of Europe to permit the easy transfer of crops and methods, there were important modifying factors. In addition to the changes introduced by the adoption of certain native crops already noted, farm management was sharply modified by the abundance of land. Practices leading to soil conservation, such as manuring the land, rotating crops, and keeping the soil supplied with humus, had been well

³ For a brief history of property in land see N. S. B. Gras *A History of Agriculture*, Chapter XI. New York: T. S. Crofts and Co., 1925.

⁴ Corn was an especially valuable food and feed crop, producing more protein, carbohydrates, and fats per acre than was possible with any other crop.

known in Europe for centuries, although their use had never been universal. About the time that the American Colonies were being settled, there was a growing European interest in scientific agriculture and improved tillage methods. This interest had been stimulated by a combination of expanding markets, changing social sanctions, legal devices, and the emergence of individual ownership of farms. Improvements had been especially important in France, England, and the Low Countries.

In America the Colonists promptly reverted to the soil-depleting practices that were being abandoned in Europe. In the regions of staple agriculture, principally the South, tobacco and, later, cotton were planted on the same land year after year until decreasing yields forced an abandonment of old soils and the cultivation of new. It would be a mistake, however, to associate this practice solely with the one-crop system. Along the Northern Atlantic Seaboard, where a variety of crops—such as wheat, oats, and Indian corn—were grown on the general farm, soil exhaustion was just as widespread because the growing of these products was not alternated with soil- or humus-building crops (legumes or hay). Regardless of the original condition of the soil, after a few years, the land had to be abandoned in order to permit it to recuperate before it would yield another crop. On many farms and plantations only a small portion of the land was cultivated because the remainder had become so exhausted that it would not yield sufficient crops to pay for the cost of production. The restless search for new lands, the constant clearing of forests, and the epic migration into Indian-occupied country was related in large measure to a ruinous cropping system.

Another modifying factor in the Northern Colonies was the lack of markets for many farmers, which forced them to a large extent into a self-sufficing agriculture. A limited market near villages and along the water-transportation routes was available from the beginning. This outlet grew as transportation facilities developed.

In the Southern Colonies, modifying influences included the longer growing season, warmer climate, and varied rainfall. These environmental conditions prompted the growing of crops far different from those in Europe, such as tobacco, sugar, as well as indigo, favored by a bounty. These crops, relieved of competition with European production, found a ready outlet in the Old World.

One further characteristic of American agriculture closely associated with environment and originating in the Colonial period was an interest in the growing of cash crops. Not only were Colonial agriculturists eager to purchase merchandise from Europe, especially Great Britain, but most of them were in debt for the purchase of land and tools. While relatively cheap, land was not free, and capital equipment was

expensive. The pressure to obtain cash was well-nigh universal at this early date and was*to remain so throughout the subsequent history of American agriculture.

The Regional Pattern Around 1775

Under the influence of climate, crops, and markets, Colonial agriculture had developed important regional characteristics by 1775.

New England

New England farmers were from the first under great handicaps in establishing cash crops and for that reason were more nearly on a subsistence basis than farmers in any other region. Soil and climate sharply limited the type of crop that could be grown for sale, as did the mercantile system imposed on them by England. Subsistence farmers produced dairy products, flour, meats, and maple sugar; raw material such as wool, flax, and leather; and wood for farm carts, plows, yokes, and tool handles. The newer New Englanders had been forced to purchase their lands from the heirs of original settlers and had no ownership in the commons which were owned by the descendants of the original settlers and not by the village. But like longer-established residents, the newcomers had to have money with which to buy tea, salt, broadcloth, dairy cattle, and iron for their tools. The limited number of salable staples developed under these conditions were beef cattle, hogs, work animals, and corn to be used for stall feeding. The small urban market and town life absorbed some of these products. A portion went directly to England and another was diverted to the famous triangular trade with the West Indies. The New England farmer was able to supplement his cash income by laboring in the logging camps, by hiring out on fishing fleets, and by engaging in household production. Thus, the New England farm organization produced partly for home consumption, partly for sale at market, and partly for home manufacturing.

The Cereal Belt: the Connecticut River to the southern end of the Valley of Virginia

The Middle Colonies produced cash crops on a wider scale than did New England. Climate, soil, larger farm units, and the absorptive demand of local urban centers such as New York, Philadelphia, and Baltimore made the development of salable produce easier. A large landlord group employing tenants or indentured servants produced farm surpluses with unfree labor,⁵ with the result that large quantities of grain, flour, beef, dairy cattle, hogs, and work animals were shipped

⁵ Unfree labor was not necessarily cheap. In fact, the Colonists complained constantly of the high cost of labor.

to neighboring colonies or made their way into foreign trade. The farm organization in the Middle Colonies was much more commercial than that in New England; less self-sufficient, controlled less by operator-owner management, and devoted to fewer diversified crops.

On the whole, the soil-depleting methods were accentuated in the Cereal Belt. Farm management was less complex and more profitable, at least in the short run, when salable staples were produced than when crop rotation was allowed to build up the soil.⁶

The tobacco region: Maryland to the Carolinas

The cash-crop system reached its highest development in the South, for in this region were grown the products most acceptable in foreign markets. Farms in this area varied in size, ranging from the large tobacco plantation to medium and smaller units. Small farms producing tobacco, rice and indigo, cereals, and cattle, were especially numerous in the interior. While much of this agricultural production was intended for export, the South raised other commodities besides exportable staples. Most of the farmers were neither large planters nor poor whites. In addition to tobacco, they produced subsistence crops for local markets. But tobacco dominated the scene. It was the cash crop *par excellence*. Individual and community prosperity were largely measured in terms of the market price of this staple, favored by English mercantile regulations and sponsored by local legislation. The cultivation of tobacco undoubtedly influenced the development of the plantation form of farm organization, although it should be remembered that tobacco was also grown on smaller farms along with diversified crops. Probably of greater importance in the emergence of the plantation were abundant lands and an unfree labor supply: indentured servants and later slaves. These conditions lent themselves readily to the establishment of large producing units operated by owners or managers.

Concentration on staple production here again led to the exploitation of the land. Cumulative forces prevented the South from adopting a permanent soil-maintaining agriculture. Even a drop in tobacco prices offered no stimulus to change from the one-crop system, because the investment, based largely on credit, did not permit a shift to new types of produce and slave labor was unskilled and not sufficiently flexible to be adjusted to diversified production.

⁶ The author of *American Husbandry*, first published anonymously in London in 1775 and republished in 1939 under the editorship of Harry J. Carman, commented upon the "slovenly" land clearing done by the Colonists. He wrote of Pennsylvania, "Wheat is the grand article of the province [but] they sow a piece of land with wheat until it will bear wheat no longer." He then described the practice of abandoning overcropped land until it had recovered some of its original properties.

The Conditioning Factors, 1775-1860

Mechanization of agriculture

The important contrast between Colonial agriculture and that during the time before the War Between the States is largely in the more effective use of animal power, the rapid development of new lands, and the aid extended by the new era in transportation. By the early part of the nineteenth century the foundations had been laid for the development of horse-drawn farm machinery. The heavy, awkward plow of the eighteenth century, with its rough, uneven iron plating that caused excessive friction and excessive pull at the draw bar, was yielding to one with a scientific moldboard, a steel beam, coulters, and other accessories that enabled a pair of horses to do a good job of plowing two acres a day at a depth of six to eight inches. Harrowing, seeding, and harvesting implements had begun to be produced, ultimately to replace the rake, the hoe, the sickle, and the scythe. Though the newer farm machinery was as yet not in common use, its effect was widely felt.

Turnpikes, canals, and railroads had made accessible a vast agricultural empire. By the middle of the century the farm frontier had been pushed beyond the Mississippi and was invading the semiarid country near the 100th meridian. All these developments brought about profound changes in farm practices along the Atlantic Coast and created new types of agrarian procedure beyond the Alleghenies.

Agricultural development in New England and the Middle Atlantic States

After the Revolution exploitive farming continued in New England and the Middle Atlantic States. Where crop rotation was practiced the three-field system of grain, grass, and fallow prevailed. Except in eastern Pennsylvania, the Hudson-Mohawk Valley, the Connecticut Valley, and one or two other sections, most farms operated with few implements, with inferior cattle and oxen as the chief draft animals. But the general picture began to change soon after the turn of the century. The increased population of Eastern Seaboard cities after 1810 provided an outlet for more cash crops as well as a greater variety, and stimulated the adoption of improved farm machinery and replacement of the ox with the horse. There was a demand for hay to feed horses in the city, for potatoes and truck crops, for beef, for wool to supply the newly established and, by 1820, tariff-protected textile industry, for pork products, and for milk and dairy products.⁷ In re-

⁷ The population of the Eastern states increased between 1810 and 1840 from 3,487,000 to 6,761,000; and the number of urban centers of more than 8,000 increased from 3 in 1790 to 33 in 1840.

sponse to this demand there was a rise in land values; large areas were drained off, tenancy increased as immigrants leased truck lands prior to purchase of farms, further heavy mortgages were placed on farms, specialization in butter and cheese production was undertaken in northern and central New York, potato growing in Maine and Long Island, and wool production in Vermont and the hills of western Massachusetts. Farmers near urban centers did a thriving business supplying milk, firewood, and charcoal for city consumption and in furnishing sand, stone, and timber for buildings.⁸

With the further development of markets for cash crops, much of the self-sufficiency of farming began to disappear. To be sure, the farm always produces for home use because of its many by-products; moreover, transportation costs, ingrained habits, and lack of working capital impede transition. More and more farmers now purchased factory products—clothes, tools, and furniture—that they had formerly made themselves. Household industries previously located on the farms began to be abandoned. Farmers' sons and daughters migrated to mill towns. Ultimately, the farmers became as completely integrated with the pecuniary system for most of their consumer goods as the wage workers.

Soil conservation and crop rotation

Though they adopted new crops and better tools, farmers were slow to utilize soil-conserving methods of tillage. The widespread notion that fresh, fertile soil was always available at the back gate of settlements nullified the incentives to such reform. First thought to the problem was given by those who for one reason or another were unable to move to virgin territory when their own lands showed signs of serious depreciation. As early as 1700 it was not uncommon to find farmers resting their soil, in the hope that nature would recoup man's depredations. On many American farms only a small part of the cultivable land was under the plow at any particular time. Improvement came with the adoption of the "bare or naked" fallow system, whereby the land was plowed and periodically harrowed in order to cleanse it from weeds and still permit the resting period to recuperate the soil. Bare fallowing, however, was never generally practiced in the East. One important reason was the widespread growth of Indian corn, which acted

⁸ In *Two Years Behind the Plow or The Experiences of a Pennsylvania Farm Boy*, published anonymously in 1878, is a description of life on a 140-acre farm in Bucks County about 15 miles from Philadelphia near Three Turns. It shows the extent to which the proprietors of farms were depending upon cash crops about 1850. The author writes, "Turkeys, geese, and fowls that had always formed a part of our common diet at home, (in Philadelphia) and which I foolishly supposed would be as plentiful as potatoes or blackberries here, were guarded and cherished with religious care for the city market . . . Butter and eggs when not reserved for the same destination were sent to the village store and exchanged for groceries of equal value." From 40 acres of woodlot the farm produced timber, firewood, and fence rails. Other crops which could be converted into cash included corn, flax, wheat, rye, oats, and buckwheat.

as a cleansing crop. In westward regions, especially in the semiarid sections, use of bare fallowing became much more popular as a method of conserving moisture. By its use the moisture of two or more years was stored up to produce one crop, a system later known as "dry farming."

Fallowing the land was further improved by growing some "green-manure" crop, that is by planting a crop and then plowing it under. This method, especially where legumes were used, greatly increased the nitrogen content of the soil as well as adding important humus elements.⁹ The practice set the stage for a subsequent development of scientific crop rotation.

Slowness in adopting improved methods of agriculture was not due to lack of information. From the latter eighteenth century on, the agricultural literature was replete with exhortation to farmers to use crop rotations as a means of maintaining soil fertility.¹⁰ But there was profit in growing the soil-exhausting crops such as cereals, cotton, tobacco, and maize, while the soil-building crops required elaborate farm organization and investment in barns and in livestock to consume the legumes. Even farmers with livestock found it cheaper to utilize corn rather than hay as feed and in New England the large amount of permanent pasture made production of clover for feed pointless.

No adequate figures are available to show the declining yield because of soil exhaustion. New land, shifting of areas, seasonal variations in rainfall, new varieties, better culture, and other factors tend to conceal under figures of average yield what was actually happening to the land. Even so, agricultural journals and farm leaders throughout the nineteenth century complained about the decreasing yields. One tangible evidence that declining yield was beginning to affect farmers was the greater attention given to manures and later to the increasing use of fertilizers. For a long time barnyard manure, wood ashes, and leaves had been burned, dumped, or otherwise wasted. By 1860, however, the fertilizing value of these substances was better understood, and later they were supplemented by gypsum, lime, Peruvian guano, Chilean saltpeter, German potash, and Carolina phosphate. These practices, while ahead of those used by farmers who merely abandoned exhausted lands, or followed a bare fallowing system, only staved off the evil day; they did not remedy

⁹ The possibility of using legumes for this purpose had been pointed out by an American author as early as 1760. See Jared Elliot, *Essays on Field Husbandry in New England, and Other Papers, 1748-1762*, ed. by Harry J. Carman and Rexford G. Tugwell. New York: Columbia University Press, 1934.

¹⁰ See Albert Lowther Demasse, *The American Agricultural Press, 1819-1860*. New York: Columbia University Press, 1941. This is Number 8 in the Columbia University *Studies in the History of American Agriculture*, and it contains much interesting information about early agricultural practices. Agricultural journals, fairs, and societies constantly urged the use of soil-building crops. A revealing item concerns one John Johnson, who tile-drained his land, and whose neighbors commented that he "is gone crazy—he is burying crockery in the ground."

the bacteriological and physical damage to the soil by continuous cropping.¹¹

Western competition

The Eastern farmers had hardly completed the transition to the production of staple crops for the growing urban and industrial centers when they were faced with new problems of adjustment. These arose from Western competition. The flow of staple products eastward was greatly stimulated by the completion of the Erie Canal in 1825. The subsequent construction of railroads and other canals brought an increasing quantity of farm products from beyond the Alleghenies to Eastern markets.¹² Eastern wheat, suffering from soil deterioration, was unable to compete with products from the fresh, fertile, stoneless, and treeless regions of the newly opened West. By 1840 farmers as well as urban dwellers in New England were consuming flour made from Western wheat. The absence of the refrigerator car somewhat tempered the competition in beef and pork, but shipments of livestock and processed pork were coming in, and swine and beef production in New England declined sharply. With the loss of these staples more attention was given on farms to the production of milk, cheese, butter, fruits, vegetables, hay, and corn. Maine potato production in 1860 was almost double that of a decade earlier, and the Mohawk Valley was rapidly expanding its shipments of apples to New York City. Thus Eastern farmers were forced to turn to products which by reason of bulk or perishability were free of any considerable Western competition.

Further commercialization of farming, in addition to Western competition, emphasized the need for soil conservation. Specialization in the production of milk, butter, cheese, vegetables, fruit, and hay also demanded some diversification, especially where livestock was involved. Truck and vegetable farmers had to learn the value of manures in order to maintain the quality and quantity of their products. But maintenance of soil fertility was an incidental rather than a main consideration of the majority of farmers in the Northeast.

Cotton intensifies commercial agriculture in the South

Tobacco, indigo, and rice had been the chief staples of the South during the Colonial era and had constituted the cash crops that made that

¹¹ Soil-exhausting crops are those that oxidize (slowly burn up) the organic matter in the soil. The organic matter, consisting of vegetable and animal matter, helps to retain moisture in the soil and thus makes the plant food soluble or available for plant use. Soil-building crops are those with a prolific root system that adds organic matter.

¹² The Erie Canal was opened in 1825. By 1850 there were 9,000 miles of railroads in the country largely concentrated in the Northeast and Northwest. In 1860 Minnesota, Iowa, Nebraska, and Kansas were shipping large quantities of agricultural staples eastward.

region the leading commercial farm section in North America. After the Revolution, cotton production added new impetus to commercial agriculture and transformed the South's agrarian economy. Though the Revolution may be taken as the turning point, political change had little to do with the change in the basis of the South's economy. New inventions in textile production in England during the latter part of the eighteenth century created a demand for cotton that sent prices to over 40 cents a pound. Lowered production costs following the invention of the cotton gin in 1793 stimulated the raising of cotton and encouraged large-scale production.

With tobacco prices at ruinous low levels, Southern planters avidly turned to the new and profitable commodity of cotton. Tobacco, which had been raised by over half the population of the states of Virginia, Maryland, and North Carolina, declined in relative importance from 1790 to 1850. Removal of the English bounty on indigo literally wiped out its production. Rice, the leading crop along the coast of South Carolina and Georgia, increased in production up to 1850 but declined subsequently in the face of Western competition. Flax and hemp, important crops at the close of the Colonial era, finally gave way to cotton. It was cotton that became the important cash crop of the South, especially in the western sections.

Some short-stapled cotton, favored by Southern soil and climate, had been produced for domestic use during the Colonial period. Sea Island cotton, longer-stapled and more easily removed from the seed, and hence higher-priced, had been introduced in 1786 and could be grown on the lowlands of the Southeastern coast. But upland short-stapled cotton became the chief commercial crop of the South. The crop of 1800 expanded from 73,222 bales to 1,347,640 bales in 1840 and to 3,841,416 in 1860. By 1860 cotton not merely represented over half of the value of all exports from the South (61 per cent) but also fed the expanding mills of New England, the South taking in return manufactured cloth and Northwestern grain and livestock.

At first cotton production merely replaced indigo and rice cultivation. Wasteful soil practices, however, forced the planters to reach out for more land, first along the Piedmont of North Carolina and Virginia and then southwestward, so that the Alabama-Mississippi Black Belt¹³ became the world's leading cotton-producing section.

Until 1821 Georgia and South Carolina produced half of the cotton grown in the United States. In 1850 Alabama ranked first; in 1860 leadership had passed west to Mississippi, and Texas now grew more cotton than South Carolina. Cotton production on fresh Western lands, opened by transportation facilities, had supplanted that on Eastern lands

¹³ The words "Black Belt" describing this section have no reference to slavery. They refer to the rich, black, loamy soil of the region.

in the South, just as Western wheat and meat had supplanted Northern. But while Northern farmers had adjusted themselves to competition by shifting their production to supply the industrialized needs of urban centers, no such adjustment took place in the South. By 1820 abandoned cotton lands in the Southeast were eroded, denuded of fertility, and bare of vegetation.¹⁴

Southern leaders, such as John Taylor and Edmund Ruffin, warned and pleaded.¹⁵ They pointed to a wasted soil as a warning and pleaded for a soil management that would conserve fertility. Their teachings fell on sterile ground. The westward movement of cotton increased competition in the Southeast and, with the slavery¹⁶ and plantation system, intensified the one-crop system.¹⁷

Recent historians have pointed out and stressed that the Southern white population of 1860 cannot accurately be divided into the two classifications of planters and poor whites.¹⁸ Landowners of all gradations existed. Of the 569,000 farms and plantations operating in 1850 only 18 per cent could be considered as actual plantations. In the Black Belt of Alabama almost half of the farmers owned no slaves, and over three-fourths owned farms of less than 200 acres.

Not only is it necessary to view the plantation in its proper perspective but the cotton crop, important as it was, must be scaled down to its rightful place. The South raised all the cotton grown in the United

¹⁴ An address of the Hon. C. C. Clay, quoted by Frederick Law Olmstead, *Journey in the Seaboard Slave States* (New York: G. P. Putnam's Sons, 1861), p. 576, gives a picture of the Southeast just before the War Between the States. Mr. Clay says, "I can show you with sorrow, in the older portions of Alabama and in my native county of Madison, the sad memorials of the artless and exhausting culture of cotton. Our small planters, after taking the cream of their lands, unable to restore them by rest, manures or otherwise, are going further west and south in search of other virgin lands which they may and will despoil and impoverish in like manner—Indeed, a country in its infancy, where, fifty years ago, scarce a forest tree had been felled by the axe of the pioneer, is already exhibiting the painful signs of senility and decay; apparent in Virginia and the Carolinas; the freshness of its agricultural glory is gone, the vigor of its youth is extinct, once the spirit of desolation seems brooding over it."

¹⁵ See an illuminating article in *The American Historical Review*, No. 33 (1928), pp. 302-304, "The Agricultural Reformers of the Ante Bellum South" by Avery Craven.

¹⁶ J. E. Cairnes, *The Slave-Power* (Carlton, 1862) is a propaganda book written to induce England to enter the War Between the States on the side of the North. Chapters II, III, IV, and V give an excellent summary of the effect of slave labor on the land. The author says (p. 40), "When slaves, therefore, are employed there can be no variety in production. If tobacco be cultivated, tobacco becomes the sole staple and tobacco is produced whatever be the state of the market and whatever be the condition of the soil."

¹⁷ Avery Craven, *Soil Exhaustion as a Factor in the Agricultural History of Virginia and Maryland, 1806 to 1860* (Urbana: University of Illinois), is a readable thesis.

¹⁸ A balanced history of Southern agriculture is the *History of Agriculture in the Southern United States to 1860*, by Lewis Cecil Gray assisted by Esther Katherine Thompson (Washington: Carnegie Institution, 1933). The authors show that, given slavery, the plantation system became "economically and socially essential." This book should caution students against looking on the South as a vast cotton field owned by aristocratic planters. Such planters were outstanding and certainly important, but their activities were supplemented by those of many less affluent whites.

States, but in 1860 it also produced all of the country's rice and sugar, 80 per cent of its tobacco, 50 per cent of its corn, over 70 per cent of its peas and beans, 94 per cent of its sweet potatoes, and almost 30 per cent of its wheat. Kentucky produced fine race horses, and the South generally raised a high percentage of cattle, sheep, and hogs. The important position that these commodities had attained in Southern agriculture (mostly border states) also gives some indication of the possibility of diversification which gained more momentum in the deeper South a half-century later.

The Market Impulse

Transportation and urbanization opened domestic and foreign markets. The development of the Western farmlands must be associated with the extension of transportation facilities. The development of river transportation, canals, coastwise shipping, turnpikes, and railroads is intimately related to the opening of new lands. In turn, these transportation facilities gave access to domestic and export markets.

The rise of nonagricultural population also established a market for the ever-mounting volume of farm products. By 1840 there were 33 cities having a population of more than 8,000 each as contrasted with 3 in 1790.

Geographic division of production became more and more common as expanding transportation facilities made it possible for regions to specialize in those products in which soil, climate, and location gave them a comparative advantage. Because of the perishability of their commodities, dairying, especially fluid-milk production, and market gardening remained local enterprises carried on in the immediate vicinity of their markets. But increasingly frontier ranches became grazing grounds for cattle, newly developed corn lands became feeding centers, and packing plants were established near the markets in the East. Drovers guided and transported cattle from grazing to feeding areas and thence to the packing centers. Developing transportation facilities moved the packing houses west nearer to the feeding centers. Similar geographic specialization developed in the making of butter and cheese. Agricultural specialization brought nearer to the farm the economy of pecuniary exchange.

Agricultural Organization About 1860-1870

Commercial agriculture, that is production for the market rather than for subsistence, now reigned supreme. Cash crops for the growing domestic and export trade included a large variety of products with chief emphasis on grains, meats, dairy products, cotton, tobacco, and rice. The advantages of improved transportation facilities were supplemented by extensive processing plants, such as packing houses, flour mills, and

tobacco-curing establishments. An intricate system of credit, commodity exchange, and warehouses assisted the flow of agricultural goods from the farm to the market. The impact of the market on the farm organization continued to favor production of the cash crops. The sudden opening of Western lands through the accessibility given them by improved transportation, and later through Government aid did not provide for an orderly development of crops for market demands nor give due consideration to conservation of soil resources. The rapid agrarian growth of the West is sketchily emphasized in the quintuple increase of the population of Iowa, largely rural, in the decade from 1840 to 1850, and then trebling again from 1860 to 1870.¹⁹ Farming lands increased from 294,000,000 acres in 1850 to 467,000,000 acres in 1860.

Professor Nourse describes the era leading up to 1860 and after as follows: "The agriculture which produced this abundance of farm produce was the hasty pell-mell outpouring of native land grabbers and foreign immigrants upon an extraordinary stretch of virgin land, not a seasoned economic development upon lines of careful planning. . . ."²⁰

The Resulting Pattern of Agricultural Enterprise

New lands, additional railroad and transportation facilities, mechanization, urban growth, and international trade were the economic impulses that shifted and transformed farming. The fundamental needs of farming, plowing, tilling, seeding, and care of livestock were static and to that extent much of the thinking and living of farmers remained unchanged from generation to generation, even when they moved from New England to Ohio and thence to Iowa. Hence "farm-minded" folks had something in common at all times and all over the country. Yet abundance of land, methods of working it, types of farming, increasing transportation facilities, and markets served to transform agricultural practices.

With minor exceptions, Northern agriculture by 1860 was dominated by the family-sized farm worked by husband, wife, and children. All members of the family played a part in production. The husband usually did the field work; the children, depending on age, helped in the

¹⁹ *Statistical Abstract, U. S. Census, 1920* (pp. 36, 135, 137):

Year	Population, Iowa	No. of Farms, W. N. Central
1840	43,000	.....
1850	192,000	69,000
1860	675,000	185,000
1870	1,194,000	363,000

²⁰ E. G. Nourse, *American Agriculture and the European Market*, p. 28. (New York: McGraw-Hill Book Company, 1924). Professor Nourse argues that without figuring true costs (including soil exhaustion) the American farmers "were conducting the most stupendous bargain counter in the history of agriculture."

field, fed and cared for the livestock before and after school; the wife presided over the home, the chickens, and the vegetable garden. To a considerable extent the farm home also was a processing and manufacturing enterprise, where cream was separated, butter churned, meat cured, food preserved, material spun and clothing sewn, wheat milled, bread baked, and scores of other chores performed to prepare farm products for domestic use.

Possibly too little credit has been given to the family-sized farm as an institution that had much to do with the rapid development of the frontier lands. The big estates that were parceled out in Latin America to Spanish and Portuguese noblemen created a feudal agrarian society in which the work was done by slaves, peons, tenants, or share croppers. It failed to create a society with initiative and willingness to assume risks for progress. To some extent these conditions were duplicated on the plantations of the South. The family-sized farm had the virtue of making farm work the common lot of all, and therefore had a tendency to democratize society. Farm ownership was a realizable aspiration for many. Hence the American farm scene on the whole showed little or no social or economic stratification.

An Analysis of Farm Enterprise

By 1860 farm ownership was widespread. Some tenancy existed in the South and on land speculatively purchased by land companies. While the total acreage leased by farmers seemed large, the percentage of farmers who rented land was actually small. The movement to commercial farming, however, had made necessary the utilization of an increasing amount of capital for buildings, fences, livestock, machinery, fertilizer, seed, and living costs. Capital costs of land became a minor part of the capital needs of farming. Hence, even free land could be taken up only by farmers who had capital funds. Even before the Revolution, Eastern farmers had been heavily mortgaged to Eastern and English capital institutions. Scarcity of capital, with resulting high interest rates, heavily entailed the farmers of the newer country. As production expanded, high fixed charges and constantly falling prices of farm commodities constituted an ailment that was to become more pronounced after the War Between the States and to show itself in the widespread agrarian discontent. Constant appreciation of land values, much of it speculative, was one factor that concealed for a long time the uneconomic conditions under which American agriculture was operating. Cost of production and land development came in for little attention, and in no case on record was soil depletion included in them.

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CHAPTER 8

Foreign Trade in the Era of Wooden Ships

FOR THE 40 YEARS after the outbreak of the Revolution in 1775, American shipping faced abnormal conditions. Its hectic hide-and-seek existence during the Revolution was followed by a dismal decade of trade dislocations resulting from the imperial divorce; then it entered upon its exciting and profitable "heroic age" during the long Anglo-French wars. With the end of those wars in 1815, the situation became more normal, while new cargoes and new sea lanes developed alongside the old. Commerce and shipping gradually expanded into the "golden age" of the clipper ship era around 1850. After that, American cargoes still continued to increase; but by the outbreak of the War Between the States, American shipping was already showing traces of its coming long decline.

Although the Revolution offered Yankee shipping new opportunities to break loose from the restrictions of the Navigation Laws, it also confronted American trade with a tremendous and serious task. For the only time in our maritime history, the nation faced a desperate need for munitions from beyond the seas; and the mighty Royal Navy blocked the way. But that navy, for various reasons, proved to be far less dangerous in the conflict than its size and reputation had indicated. As a result of its ineffectiveness and the astuteness of the American mariners, an adequate supply of munitions arrived from France and Holland to save the desperate situation after Bunker Hill, when Washington had almost no gunpowder left. Part of the munition supply came in French ships directly across the Atlantic, and part of it in small American vessels by way of the French, Spanish, Danish, or Dutch islands in the West Indies. Once that immediate need was met, the Yankees turned to the development of commercial contacts with England's enemies. At times war risk insurance rates on American vessels rose to 50 per cent, but on the whole supplies came through safely more often than not, and our ports were kept well stocked with salt, spirits, and luxury goods.¹

Post-Revolutionary Readjustments

Peace was a less roseate story, for it brought new problems. The decade from 1783 to 1793 was one of the dreariest in the annals of

¹ R. G. Albion and J. B. Pope, *Sea Lanes in Wartime*, Chapter II. New York: W. W. Norton & Company, 1942.

American commerce. Although William Pitt and some other British statesmen indicated a willingness to grant the Americans generous commercial terms, opinion was turned in the opposite direction by the appearance of Lord Sheffield's *Observations on the Commerce of the United States*. Sheffield argued that, since the Americans were now foreigners by their own volition, they deserved no special privileges under the Navigation Laws, which should be kept in full force. He pointed out, moreover, that force of habit and superior service would undoubtedly keep the Americans coming to British ports, whatever discriminatory steps England might take, and that no serious alienation of trade by the French or the Dutch need be feared.

As a result, the Americans found to their consternation what it was like to be forced to view the British Empire from the outside. Particularly galling was the barring of their vessels and some of their exports from the British sugar islands, which had played so important a role in Colonial economy. The rich merchants of the big ports were less affected by this loss of the lucrative "sugar triangle" because they could participate in the profitable new trade around the Cape of Good Hope to the Far East. That new sea lane had been inaugurated in 1784 with the voyages of the *Empress of China* from New York to Canton and of the *United States* from Philadelphia to India; these pioneer ventures were soon followed by the spectacular exploits of Salem vessels in the Eastern seas. But voyages of that sort tied up capital for longer periods than the "little fellows" could stand; and many of these, who had been accustomed to load some local produce upon a small sloop for a voyage to the Caribbean found that business was not what it used to be before the Revolution had closed the door to the privileges of trading within the British Empire.

As far as the sugar trade was concerned, the inconvenience was temporary, for France, Holland, Denmark, and even Spain soon opened at least some of their Caribbean ports to American vessels. Not until 1830 was trade with Jamaica, Barbados, and the other British islands fully reopened for the Americans, but they found Haiti and later Cuba to be fairly adequate substitutes. The real victims of British commercial policy were Britain's own Caribbean planters and their slaves; they were now cut off from their previous abundant and cheap supply of flour, fish, and lumber, which could not be obtained in sufficient amounts from the remaining British North American colonies.

Although some Caribbean ports were thus still open to the Yankee vessels and cargoes, the "sugar triangle" as such was gone, since its profitable side, the "long haul," was closed to them. American cargoes could still be swapped for sugar, molasses, and rum at French and other non-British ports, but the Americans themselves had to consume all return cargoes, since the rich freight earnings from the "long haul"

across the Atlantic of such surplus cargoes were reserved by European nations for themselves. Consequently, Yankee schooners and sloops, which flocked to those foreign islands in considerable numbers during the postwar years, found that the pre-Revolutionary good sources of shipping profits were now much reduced.

Sheffield had been correct in predicting that, despite the harsh British prohibitions, the Americans would soon gravitate back to London, Bristol, and the fast-growing port of Liverpool. During most of the next century, England and the United States were to be each other's best customer. The French tried to follow up their Revolutionary contacts and good will with the establishment of regular official packet sailings between Lorient and New York, but the hoped-for luring of American trade did not materialize. The differences in language and in weights, measures, and materials, along with less generous credit arrangements offered by French merchants, drove the Yankees back to the familiar ports where they knew what they were getting and where they would be given ample time to pay. The beginnings of the Industrial Revolution, moreover, made England's offerings more attractive than ever, and the British went more than halfway by dumping cargoes at bargain rates in the American ports vacated by the redcoats.

A gloomy tone ran through the letter books of the American merchants during the middle and late 1780's. British goods would not, of course, keep coming forever unless they were paid for, and payments were becoming increasingly difficult, with the British West Indies cut off, the grain crops ruined, the state currencies in a jumbled condition, and debts everywhere.

One Scot residing in New York as a factor wrote to his correspondents, soon after the British left: ²

Every week day has the appearance of the Holidays in old times. Money scarce and daily draining, trade dull; in short, nothing but vendues and commission stores seem now to be in vogue. The gentlemen of the army form a considerable part of these, but one-half of them must soon either starve or become bankrupts at the expense of their neighbors.

The new Federal Constitution in 1789 was welcomed by the merchants as a means of presenting a united front for international bargaining purposes, but that could not remedy everything.

Neutral Opportunities

April, 1793, brought a British mail packet to New York with the long-desired answer to the American merchants' prayers. England and France were again at war; and, as a neutral, the United States was on

² Macgregor *Letter Book*, N. Y. Public Library, quoted in *N. Y. History*, Vol. 21 (1940), p. 396.

the threshold of a tremendous maritime boom. This boom was created chiefly by the opportunities in trade for neutral vessels where belligerents dared not sail. Such voyages risked seizures and other complications, but until the end of 1807 neutrality meant increased prosperity; between 1807 and the final fall of Napoleon, however, those same seagoing ventures involved more trouble than profit.

Most important of the new opportunities was the recovery of the profitable long haul of West Indian sugar across the Atlantic. With the British Navy pretty well controlling the seas, French vessels ran great risks in voyaging between Haiti and Bordeaux or between Martinique and Nantes. France threw open the long haul to the Americans. England interfered and started to restrict the trade altogether, but finally winked at the subterfuge of breaking the voyage at some American port. By this "broken voyage" system, a Yankee brig would load sugar and coffee at Haiti, for example, and carry it to New York. There the cargo would be unloaded and the customs duties paid. The next step was the reloading of the same cargo while most of the duties were refunded! Now the vessel could proceed eastward on a "neutral" voyage to a French port free from the hazards of seizure. The return voyage would be of the same sort, with French goods brought to the islands by way of New York. Our trade statistics became suddenly inflated by the entry and quick withdrawal of hundreds of such cargoes, in which we had only a fleeting but very profitable interest. During several years around the end of the century, such re-exports outweighed the domestic exports of our own products.

Meantime, other American vessels were making rich earnings in diverse ways. Good profits came from the freight money in "tramp" voyages between foreign ports where it was not safe for belligerents to enter. Concurrently the British West Indian ports had been opened to our smaller vessels, which were not large enough to carry sugar across the Atlantic. There was also steady business in the shuttle between America and England, while the number of vessels on the run to the Far East increased.

With vessels able to pay for themselves in a voyage or two, shipbuilding boomed along the coast, so that our tonnage doubled and then trebled over the prewar level. This state of affairs reached its climax in 1807, when American imports reached a total of \$138,500,000 as compared with \$31,500,000 in 1792, a higher figure than any attained until 1835.

Then came, in turn, Embargo, Non-Intercourse, and finally the War of 1812 to shut down seagoing adventures. Despite the popular impression of our "humbling the pride of the Royal Navy" in that war, the effect upon the United States' shipping was serious if not disastrous. That same navy was able to impose such a strangling blockade of every seaport along our whole coast in 1814, that almost nothing came or

went by sea. At times it was not even safe to sail between New London and New Haven on Long Island Sound.³

Luckily we were not long at war, and the coming of peace to the world's sea lanes in 1815 brought more normal trade conditions in place of the artificial stimuli, the dangers of neutral trading, and the crop of wartime regulations. The time had come for the new nation to settle down to the establishment of regular sea routes in a fairly normal world.

The Return to Normal Trade

The most important features of American commerce for the next 30 years were to be the continued increase of our trade with England; the development of substantial business with France and Germany; the emergence of cotton as the chief American export; and the rapid development of Cuba as a substitute for the other old Caribbean markets. Later, increased immigration, the final willingness of England to buy American grain, and the new trade with California were to provide the added stimuli for pushing our shipping to its climax. That story is summarized in the table on the following page.

The tea cargoes from Canton and the pepper from the "Salem East Indies," representing the most glamorous part of the nation's trade, have received more than their rightful share of attention. In volume and value, they amounted to only a fraction of the prosaic products of the Industrial Revolution that were brought month after month from Liverpool to New York across the stormy 3,000 miles of North Atlantic in the teeth of the "westerlies." England's time-honored woolens from Yorkshire generally headed our list of imports in value, but the newer cotton goods from Manchester and other places in Lancashire surpassed them in yardage and were fast catching up in value. These textile imports went far in clothing those Americans who did not wear homespun. The domestic textile industry was not doing well; it had blossomed briefly during the war interruptions but had been stifled by England's heavy dumping over here of textiles that had been accumulating in wartime while the world markets were unavailable. Huge quantities were rushed to the American ports to be sold at very low prices. Hardware from Birmingham and cutlery from Sheffield likewise crammed the holds of the freighters from Liverpool. Later, when the railroad boom was under way, iron rails were to be a further stimulus to British exports.

Throughout the world, England was profiting from her long head start with industrial machinery, but the United States was the best of all her customers—better, by far, than in the days when the Navigation Laws had forced Americans to buy from her. That fact was not lost

³ For a thorough description, see A. T. Mahan, *Sea Power in its Relations to the War of 1812*, 2 vols. (Boston: Little, Brown & Company, 1905.)

FOREIGN COMMERCE OF THE UNITED STATES, 1821-1860 *
(In millions of dollars)

	1821	1831	1841	1851	1860
Total Imports	62	103	127	220	362
Total Exports	64	81	121	218	400
Grand Total	127	184	249	438	762
Combined Imports and Exports:					
United Kingdom	46	77	96	211	340
France	10	17	41	55	105
Cuba	11	13	17	23	46
British North America	2	4	8	18	46
Germany (Hanse)	3	5	6	16	36
Brazil	1	4	9	18	27
China	7	4	4	9	22
Imports, by Ports (state totals):					
New York	23	57	75	111	248
Boston	14	14	20	32	41
Philadelphia	8	12	10	14	14
New Orleans	3	9	10	12	22
Baltimore	4	4	6	6	9
Exports, by Ports:					
New York	13	25	33	86	145
New Orleans	7	16	34	54	107
Mobile .....	..	2	10	18	38
Boston	12	7	11	12	17
Philadelphia	7	5	5	5	5
Baltimore	3	4	4	5	9

(In thousands of tons)

	1821	1831	1841	1851	1860
Total Documented Tonnage	1,298	1,267	2,230	3,772	5,353
Total Registered Tonnage	619	620	945	1,726	2,546
Total Steam Tonnage .....	..	68	175	533	867
Total Shipbuilding Tonnage	55	85	118	298	212
Total Documented Tonnage (by states):					
New York	248	300	490	1,050	1,661
Massachusetts	334	342	531	694	835
Maine	136	163	304	536	784
Maryland	126	73	113	204	254
Tonnage Cleared, Total	880	1,244	2,371	5,130	8,789
Per Cent American	(91%)	(77%)	(69%)	(62%)	(71%)
For British North America	118	174	852	2,139	4,465
United Kingdom	173	341	421	952	1,557
Cuba	107	150	208	391	695
France	38	68	155	184	360

* From annual *Report on Commerce and Navigation*. Partial summaries in J. S. Homans, *Foreign Commerce of the U. S.* (New York: G. P. Putnam's Sons, 1851) and R. G. Albion, *Rise of New York Port* (New York: Charles Scribner's Sons, 1939). For a 1793-1815 statistical summary, see R. G. Albion and J. B. Pope, *Sea Lanes in Wartime* (1942).

upon the economic-minded "Little Englanders," who were ready to let their colonies of settlement break loose after pointing out that England did more business with New York, which cost them only a consul's salary, than with Canada, Australia, New Zealand, and South Africa combined, which took millions to defend.

Trade with France, which had failed to materialize after the American Revolution, came into its own about 1840. Silks and other luxury goods vied with wines for space in the packets from Havre; Paris fashions even then meant much to Americans. The ships from Havre were generally

smaller than those from Liverpool, but they came often because of the constant demand for the very latest styles. Heavier and coarser wares, in ever-increasing quantities, arrived from the old Hanse ports of Bremen and Hamburg, through which passed most of our trade with Germany.

French and German trade combined, however, did not amount to half of the British total, while none of the other European countries came anywhere near their separate totals. Boston did a moderate amount of business in the Baltic and Mediterranean, but it was only a trickle compared with the heavy volume of traffic on the Anglo-American main line, which increased further in volume in the fifties as women began to swathe themselves in more and more cloth.

Cuba was the outstanding new field of exploitation during the period, generally ranking third in American markets, preceded by England and France. Along with Puerto Rico, which developed a respectable trade with us also, it was all that Spain retained after 1825 of her former vast American colonies. Ironically, it was worth more to Americans commercially than all the newly freed republics of Spanish-America, where we entertained such high hopes of commercial opportunities. Close to our shores, Cuba was easily accessible in its new role as successor to Jamaica as a source of sugar and as an outlet for our offerings. At Havana, Matanzas, and elsewhere along the Cuban coast, American businessmen advanced money to the Cuban planters, catered to their various wants (all the way from food to coaches and railroad cars), and brought back huge quantities of sugar. The island was thoroughly brought within our sphere of economic influence more than half a century before we finally pried it loose from Spain. By the time that England eventually permitted us to trade freely with Jamaica and her other sugar islands, we no longer had any particular interest in doing so. Those islands, which were soon to be deprived of their slaves, were falling rapidly from their former proud position.

The United States did a fair business with Mexico and the struggling little Spanish-American republics of the Caribbean. England, on the other hand, had the bulk of the trade with the more remote parts of South America, which were as near to London as to New York; their commodities, moreover, fitted better with England's for a mutual exchange. Trade with Buenos Aires, Montevideo, and Valparaiso thus remained on a modest scale, although with the forties a new trade began in guano or bird-dung, brought in odorous cargoes from islands off Peru for use as fertilizer. With Portugal's former great colony of Brazil, trade went better. Its rapidly-growing coffee output was an accessible and economical substitute for imports from distant Java, and our vessels flocked to Rio for coffee. However, American products did not find there a ready market.

Although the coffee from Brazil was worth more than the tea from

Canton, the Chinese were better customers than our neighbors to the southward. At first, to be sure, the Americans were hard pressed to find something with which to pay for the teas, silks, and chinaware brought around the Cape of Good Hope. The always-acceptable silver dollars were scarce in our seaports, and the initial cargoes of ginseng—a drug supposed to restore vigor to old men—quickly glutted the market. Yankee ingenuity soon developed, without too much outlay of capital, offerings of furs obtained by trading with Indians on the Northwest Coast or by killing seals in the Antarctic. Sandalwood from Hawaii likewise went well at Canton, and, for a short while in the thirties, opium could be carried over from India. Eventually the Chinese, who had originally shipped cheap cotton “nankeens” to us, began to purchase some of the products of our cotton mills. Salem continued to do a thriving pepper business with Java and Sumatra for a while. Boston kept up a good trade with India, even sending out ice, while various ports traded with Spanish Manila.

American shipping statistics at this point tend to be distorted, unless regarded with caution, by a fast-growing trade at our very doors. A glance back at the table on page 161 shows that by 1841 more tonnage cleared for British North America than for any other country. Some of it resulted from little coasting voyages up to the Maritime Provinces, but the bulk of it consisted of freshwater trips across the northern frontier. These even included the constant comings and goings of little craft on the Detroit and Niagara Rivers. The tonnage, it will be noted, was out of all proportion to the value of the cargoes sent and received.

New Commodities and Opportunities

More striking than any other change in commerce during those years was the sudden development of cotton exports. Absent from Colonial offerings, the cotton bale quickly overshadowed every other commodity in our foreign commerce, as the following figures indicate:

PRINCIPAL EXPORT AND IMPORT COMMODITIES, 1821-1860 *
(In millions of dollars)

	1821	1830	1840	1850	1860
Exports:					
Cotton	20.1	29.6	63.8	71.9	191.8
Wheat and flour	4.4	6.1	11.7	7.7	19.5
Tobacco	5.6	5.5	9.8	9.9	15.9
Lumber and wood manufactures	1.5	2.0	2.9	4.8	14.6
Cotton manufactures .....	..	1.3	3.5	4.7	10.9
Imports:					
Woolens	7.2	5.9	10.8	19.6	43.1
Cotton manufactures	7.3	7.8	6.5	20.7	33.2
Coffee	4.4	4.2	8.5	11.2	21.8
Sugar	3.5	4.6	5.5	7.5	31.0
Hides, skins, and furs	1.1	2.7	3.1	5.8	12.3

* Reports on Commerce and Navigation, summarized in U. S. Statistical Abstract, 1941, pp. 528-531.

The invention of the cotton gin, just as the Anglo-French wars were starting, gave the Southern states a staple export for which the demand increased steadily as the Industrial Revolution gained headway. What was more, by means of it the nation kept a closer balance in foreign trade by offering something which England and the rest of Europe would take in exchange for what they sent westward across the Atlantic.

Out of that situation grew one of the most original and impudent patterns in the story of America's foreign trade—New York's "cotton triangle." Along with the establishment of sailing packet lines for regular transatlantic service, the development of an auction system for the centralized sale of European imports, and the building of the Erie Canal, it was one of the main steps by which New York shot ahead of Boston, Philadelphia, and Baltimore in the years immediately following 1815 to become "the great commercial emporium of America." By its excellent packet lines the port was able to attract to Sandy Hook most of the incoming cargoes of European manufactures, but it had no adequate local offerings to fill the holds of the returning vessels. It therefore took advantage of the chronic commercial passivity of the South, which might perfectly well have developed a direct shuttle trade from the cotton ports of Charleston, Savannah, Mobile, and New Orleans to England. Instead, the enterprising New Yorkers dragged the cotton shipments 200 miles out of their normal course to bring them to their own docks and there transship them in other vessels, while the South's imports from Europe were influenced to take the same roundabout course.⁴ Like Amsterdam and London before it, New York thus derived heavy entrepôt profits from this routing of the trade of others by way of its own wharves. Its commission agents—mostly, as it happened, Connecticut Yankees, established themselves in interior Southern cities, just as the Scottish factors had settled in the Chesapeake region before the Revolution. New York banks loaned money on the crops; New York vessels carried the cotton; and the sum total of commissions and profits, it was reckoned, amounted to 40 per cent of the value of the cotton. If any one man may be credited with developing this system, it would be Jeremiah Thompson, who came to New York to sell the woolens from the family factory in Yorkshire. The cotton exports developed from the need for return cargoes; and so, too, did Thompson's establishing of the Black Ball packets to carry those shipments between New York and Liverpool.

Between 1846 and 1848, three events gave a tremendous new stimulus to American shipping and carried it to its peak in the next five years:

⁴ In 1822, New York's domestic exports amounted to \$9,228,000, of which cotton stood first at \$3,925,000, while Southern products as a whole amounted to 55 per cent of the total.

the potato crop failed in Ireland; Germany had an epidemic of unsuccessful revolutions; and gold was discovered in California.

As a result of the potato famine, a steady demand developed in Britain for the wheat of the Middle Atlantic and Mid-Western states. England had wanted little of this, it will be recalled, during the Colonial period, and from 1815 on the Corn Laws had closed the market except in emergencies. Now, the victory of the industrial over the agricultural interests in Parliament, culminating in the repeal of the Corn Laws, opened the way for new possibilities in this trade. Whereas the Caribbean islands and Brazil generally imported their breadstuffs already ground into flour, the British preferred to purchase the grain and thereby keep the extra processing profits for themselves.

Not only did this new market for American wheat bring a new demand for shipping on the Atlantic shuttle, but the potato famine also was responsible for providing new passenger business for the return voyage. The population of Ireland fell off by one-fourth during those terrible years. Many starved to death, but many more migrated to America in the overcrowded between-decks of Yankee square-riggers at about \$20 a head. The immigration from Ireland rose from 52,000 in 1847 to 163,000 in 1851. During the next three years, it was topped by the arrivals of Germans leaving their homeland because of political and economic conditions. Their numbers jumped from 69,000 in 1851 to 176,000 in 1854. That was the peak year when the newcomers from all countries reached a total of 460,000.

The grain and the immigrants swelled the burden of traffic upon what was already the most important of the world's sea lanes; the news of gold in California, on the other hand, suddenly opened a spectacular new route, 16,000 miles around Cape Horn to San Francisco. Passengers, mails, and gold moved by steamships that landed them on each side of the Isthmus of Panama or on Nicaragua. Then they were taken overland to the other ocean to complete their journey by sea. General cargo, on the other hand, was carried in swift square-riggers around the stormy Horn.

Shipbuilding and Shipping

So much for cargoes and trade routes. As for the vessels that handled the business, the National Government did something to stimulate and protect the American merchant marine, but it did not have to do a great deal. It should be borne in mind, in connection with shipping policy, that the interests of the shipper, the shipowner, and the shipbuilder are not always identical. The shipper is apt to want the cheapest freight rates possible, regardless of whether his cargoes are carried in American or foreign vessels. The shipowner (who was less and less apt to be carrying his own cargoes as time went on) wants to have the government

discriminate against vessels under foreign flags, but would be glad to be able to buy foreign-built ships at times when they might be cheaper than home-built ships. The shipbuilder, whose demands are the most extreme, wants all the privileges reserved to American-built vessels. Congress, throughout our history, has generally given the shipbuilders that desired protection, in the same spirit in which Parliament had legislated in favor of English-built ships in the Navigation Laws. Incidentally, the application of those Navigation Laws after the Revolution broke up the old practice of selling American vessels in the English market; indeed, not until the final repeal of the Navigation Laws in 1849 was that possible again.

Very real protection was extended our vessels by the Government in 1818, through granting them a monopoly of our coasting trade. This amounted to more here than did similar measures in England and other European countries, because the coasting voyages were generally longer and consequently involved heavier freight earnings than the shorter hauls in other countries. The important route between New York and New Orleans, for instance, was 1,711 miles, which was more than half the length of the transatlantic run. The technical extension of the principle to the route around Cape Horn from East Coast ports to California, in order to bar foreign vessels from that long "coastal" voyage, helps to account for the heavy profits in the early clipper period. Even a half-century after that, when our shipping was in decline, similar "coastal" protection to the trade with Hawaii, Alaska, and Puerto Rico kept alive most of the few flourishing units in our merchant marine.

Discriminatory port dues and similar devices, especially in the earlier period, were occasionally employed in order to extract concessions from foreign nations. Our interrupted trade with the British West Indies saw several cases of this practice, as did American trade with France in the years immediately following 1815. Subsidies, that later common form of Government aid to shipping, however, were not granted by Congress except to some lines of mail steamships, around 1850, and to the fishing fleets in the form of bounties.

As for the ordinary sailing vessels, they did not need such financial aid to hold their own against foreign competition, because they enjoyed a decided advantage in construction costs. Thanks to an abundant supply of oak and pine close at hand, wooden vessels could be built along our coast much more cheaply than in England, where much of the timber and all the masts had to come from either the Baltic or from America. Transportation was the principal item in timber costs; a log delivered in England cost 15 times as much as the value of the tree itself growing in a Polish forest. That condition explained the English readiness to buy American-built vessels in the Colonial period, and this advantageous position of American shipbuilding lasted for much of the

era of wooden ships. In 1791 the best new American ships cost about \$34 a ton, while similar vessels built in England cost from \$55 to \$60 a ton. A similar differential lasted as late as 1830. Naturally the American shipbuilder could fully hold his own in competition with the British in freight rates. It might cost more to feed and pay American crews, but the superior operating efficiency of the average American captain tended to offset that.

By 1840 some of that early advantage in construction cost was being lost. The American builder was having to go further and further afield for his timber, while England was beginning to buy cheap vessels from Quebec and the Maritimes. After the repeal of the Navigation Laws, the English once more turned to our builders for ships to compete with vessels flying our flag. Later, when steam and iron began to replace wood and canvas, the construction advantage passed to the British shipyards.⁵

Most of the freighters of those days were bluff-bowed, "burthensone" tubs, in which speed had been deliberately sacrificed in order to secure maximum cargo capacity. At times, however, when speed was essential for particular purposes, the Americans led all competitors in turning out fast vessels. The speedy little Baltimore "clipper" schooners and brigs proved particularly useful in dodging inquisitive British warships during the Revolution and in later troubled periods at sea. Their streamlined design was later to influence the construction of pilot boats and other fast craft. The climax in speed, however, came with the China and California clipper ships built around 1850. With sharp, concave hull lines in place of the bulges of earlier ships, and with lofty masts designed to carry a tremendous amount of sail, they made remarkable records on long runs where speed was important enough to offset the loss in carrying capacity. For ordinary runs, however, less extremely specialized vessels were still built.

Along with those developments went a gradual increase in the size of the larger vessels. The average full-rigged ship of 1800 measured about 250 gross tons, equivalent to the capacity of eight modern railroad freight cars. By 1850, ships of 1,000 tons were frequently launched, while a few of the bigger clippers exceeded 2,000 tons. For the lesser runs to the Caribbean and along the coast, however, 200-ton brigs and 100-ton schooners continued to carry the bulk of the business.

On the quantitative side, shipbuilding was decidedly sensitive to external stimuli. The first great boom came during the neutral trading between 1793 and 1812, with the merchant marine reaching a peak of 1,124,000 tons in 1810. For some time after 1815, the tonnage slumped;

⁵ These economic aspects are thoroughly analyzed in J. G. B. Hutchins, *The American Maritime Industries and Public Policy*. Cambridge, Massachusetts. Harvard University Press, 1941.

and not until the mid-forties did the totals begin to climb substantially. In 1854, the peak year of building, the American yards turned out 361 ships and barks, 126 brigs, 605 schooners, 669 sloops and boats, and 253 steamers. This total of 2,034 vessels measured 583,000 tons, or ten times the tonnage built in 1830. In the same year, 1854, our merchant marine almost equaled the British in tonnage. Its total continued to increase until 1861, when it reached 5,539,000 tons. The British, however, had drawn still further ahead by that time.

At an estimated average value of \$40 a ton, our shipping was thus worth about \$500,000,000. By that time, the capital invested in railroads was about four or five times that amount, and the same was true of industrial establishments. In the earlier days, however, when factories were few and railroads had not yet appeared upon the scene, shipping was one of the outstanding outlets for capital seeking investment. This was one of the reasons for the very keen concern for our neutral vessels during the hectic period of wartime trading in the French Revolutionary and Napoleonic period.

Except for steamers and occasional whalers, the corporate form of ownership was rare. The title to the average vessel was divided into eighths, sixteenths, or even sixty-fourths. Occasionally, a wealthy merchant like John Jacob Astor or Stephen Girard would own a considerable fleet outright. Very frequently the partners in a commercial house might own one or more vessels between them. In very many cases, however, the shares were divided among the shipbuilder, the sailmaker, the captain, merchants—sometimes those in various ports—and casual investors who had nothing to do either with the building, the lading, or the sailing of the vessel. One of the owners would generally serve, for a commission, as the operating manager or "ship's husband."

Functionally, there were three classes of merchantmen: the "transient" or tramp; the "regular trader"; and the packet or liner. Most numerous were the transients, which went wherever freights were to be had, not restricting their movements to particular ports. They were the marginal ships, useful in handling seasonal movements of cotton, wheat, sugar, and the like, but never at all certain of business between seasons. The "regular trader" generally plied between two or more particular ports, primarily engaged in carrying her owners' cargoes, but ready to utilize any extra space for general shipments. The packet, forerunner of the liner, went a step further in regularity by sailing on specified days of the month, instead of waiting around port until she was full.

The latter line service attracted not only passengers but also the bulk of the "fine freight" and less-than-shipload business. Even in the eighteenth century, British Government mail packets had maintained service on schedule, but line sailings by a group of private vessels as common carriers for cargo began in the first week of January 1818,

when the first ships of the Black Ball Line sailed from New York and from Liverpool. New York, which had taken the initiative in this business, soon had weekly sailings to Liverpool, with less frequent service to London and to Havre. Closely correlated with this transatlantic shuttle were its coastal packet lines to Charleston, Savannah, Mobile, and New Orleans. These brought cotton for the eastbound ocean voyages from New York and distributed southward part of the merchandise brought from beyond the seas. Lesser lines of schooners or brigs performed similar functions on the shorter coastal runs.

By the time that steamships came on the scene, line service had been thoroughly and successfully established by those "square-riggers on schedule," the sailing packets. The steamers took over line service almost from their beginning, for they had the distinct advantage over sail in that their date of arrival, as well as their day of departure, could normally be predicted in advance.

The lone voyage of the auxiliary steamer *Savannah* to England in 1820 did not lead to immediate results. Regular transatlantic service dates from 1838, when the *Sirius* and *Great Western* arrived at New York from England within a few hours of each other. In 1840, Samuel Cunard began his celebrated line. By the late forties, Congress began to subsidize competition under the American flag. The initial mail lines to Bremen and Havre did not come to much, but the Collins Line to Liverpool gave Cunard severe competition in speed and luxury during the early fifties until, after two severe disasters resulting from excessive speed, Congress withdrew its subsidy. From that time on, liner traffic on the Atlantic shuttle has been for the most part under foreign flags, whereas formerly the Yankee sailing packets had had the field pretty much to themselves.

Whatever the flag, however, New York was generally the western terminus of the cream of the transatlantic trade. Its geographically central position, its excellent harbor, and the various products of its initiative gradually lured business away from its rivals until, by the eve of the War Between the States, it was pretty much monopolizing the import business from Europe and handling a substantial share of the nation's exports.

Although New York has thus had definite primacy among our ports for more than a century, no single port has enjoyed a clear-cut second place. Boston ranked second to New York in imports, thanks to its special initiative in the Baltic, the Mediterranean, and the Far East. New Orleans, on the other hand, stood second in exports to New York (for a brief period around 1840 it was actually first), as it was an important outlet for the cotton trade; not all of its cotton by any means traveled up the coast to New York in the "cotton triangle," although most of it was carried in New York vessels. Mobile eventually came

third in exports, but imported almost nothing. Philadelphia and Baltimore came next, with the Maryland port gradually catching up with its once-distinguished rival on the Delaware. Gradually, the lesser ports suffered from the tendency toward concentration, accentuated by the railroads, which the major ports pushed westward in competition for the trade of the hinterland. In shipping, as distinct from commerce, the South played a negligible role. New York led, as in other fields, with Boston a strong second, while Maine built and sailed ships in a volume out of all proportion to its relatively meager trade. The unequal distribution of shipping was to have an important influence upon the maritime aspects of the War Between the States.

By 1861, the high tide of the early fifties had already begun to ebb, as far as shipping was concerned. Although the total tonnage in that year was higher than ever before, and higher than it was again until the First World War, elements of decay were already apparent. The profits of the early clippers had led to overproduction of ships, so that there was not business enough for all those fast and beautiful vessels, too slender for profitable service on ordinary runs. The panic of 1857 aggravated the situation, while England, which was already using much steam and iron, was once more drawing ahead. The ravages of the Confederate raiders, such as the *Alabama*, upon our shipping in the War Between the States frightened great numbers of shipowners into foreign registry for their vessels; but that transfer simply aggravated a decline which had already set in. The half century after the War Between the States was the dark age of the American merchant marine.

Shipping, however, was no longer so closely tied up with commerce as it had been in earlier days, when the merchant carried his own cargoes in his own ships. The nation's imports and exports, therefore, continued merrily upward in volume, even while the American tonnage figures were shrinking away. Importers and exporters could find plenty of foreign vessels to carry their cargoes. While this new state of affairs spelled trouble for the shipping districts of eastern New England, New York was still able to carry on a thriving business along those set lanes that had been developed between the Revolution and the War Between the States.

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CHAPTER 9

American Transportation Before the War Between the States

SEPARATION FROM ENGLAND radically changed the political and economic demands for transportation in the newly freed American states. Transatlantic commerce had been dominant, and maximum use had been made of the cheapest type of transportation then available—namely, by water, with the wind as motive power. Each colony had had its ports, either on the ocean or on navigable rivers, to and from which the long-haul foreign traffic was carried by economical sailing vessels. Land traffic to the hinterlands of the many ports had till then been confined to narrow zones because of the low density of population in those parts of the country and the great expense of land transportation.

After the Revolution both political and economic factors prompted an interest in the promotion of freer intercommunication between the former Colonies. Such connections would further political unity, and would make the varied resources of the several states accessible for the benefit of all. In addition, there was the urge to make available the wealth of the Western areas of the North American continent. A unified system of transportation required increased use of north-and-south coast-wise water routes to take advantage of the economical water transportation and indicated the need for parallel inland highways wherever topography did not permit the use of water routes. Contact with the West called for greatly increased use of land transportation, except in the areas adjacent to the larger rivers flowing into the Atlantic or the Gulf of Mexico.

Characteristics of Early Land and Water Transportation

It is hard to realize today the limitations that a forced dependence upon land transportation for interior communications imposed on the new republic. Pack animals have a very limited capacity, and hence this mode of transportation, which was used in the trans-Appalachian traffic, was expensive. It has been estimated that on level ground a horse can move but one-tenth as much by pack as by wagon. Nevertheless, pack animals were used extensively because the improvement of roads required resources that, except for a few key routes, could not be

spared. Clearly, then, roads were a necessity if horses were to be used in the most effective way. Even where roads were built, however, wagons or sleds could be used only during part of the year, in the drier season, or when the ground was solidly frozen but not obstructed with snow. Compared to water transportation, wagon-borne traffic was fabulously expensive. This fact was dramatically illustrated by the route and rates for shipment of grain from Northampton, Massachusetts, to Boston. Though the direct overland distance was only 100 miles, it apparently paid to use the circuitous water route of over 300 miles around Cape Cod to take advantage of the cheapness of the water transport. The water part of the route of some 250 miles (from Windsor down the Connecticut River to Hartford, thence to Long Island Sound and around Cape Cod) involved a cost of but 6 pence, whereas the short 36-mile land journey from Northampton to Windsor cost 12 pence, about 13 times as high a rate per ton-mile.

Although great cheapness favored water transportation in those days, another characteristic was as important in its economic implications. The boats of that period, whether they were for coastwise or for ocean shipping, were relatively small and drew little water. Twenty-ton sloops were standard vessels used in coastwise service, for instance. This meant that harbors and rivers were navigable to an extent not possible for the larger vessels of today. It also meant that even a fairly small-scale industry used large enough quantities of goods to make use of a substantial portion of a boat's cargo or even a complete shipload. The combination of these two factors enabled many places, not now commercial ports, to rate as such and to support seaport industries. Essex, Connecticut, near the mouth of the Connecticut River, for instance, was able to maintain the piano-key industry in its hinterland, to be a port of import for ivory direct from India, and to warrant the complementary operation of a shipyard. Today such an arrangement would not be conceivable, because modern steamers could not reach Essex nor could unloading facilities be supported on so small a flow of commerce.

The War of 1812 demonstrated how important the low-cost coastwise water routes were to our economy. With the British dominating the seas, our coastwise traffic was reduced to a trickle. The result was that flour purchased in New York for use in Boston, which had in peacetime cost but 75 cents a barrel more in Boston as a result of transportation cost, suddenly became \$5 a barrel more when it had to be moved overland. Likewise, cotton from the South doubled in price on a delivered basis at Providence, Rhode Island.

Development of the Highway Systems

The dangers that threatened the nation because of lack of adequate north-and-south highways in case an enemy cut off coastwise transport,

together with the need for developing areas of the country where water transportation was not available, compelled the Government to give more serious thought than ever before to developing a network of inland highways regardless of the high cost of land transport. Furthermore, the post roads and "King's highways" which had been bequeathed the country by the Colonies were not laid out in a pattern that catered to the needs of a society that was pushing westward and developing Eastern lands far more intensively. While private interests assumed some of the responsibility for the provision of highways, there was a feeling that private enterprise could never be profitable in the face of normal coastwise competition from boats that would take most of the traffic. A belief that governmental subsidy was needed led Secretary of the Treasury Gallatin to propose in 1807 that a Federal canal and highway system be constructed parallel to the Atlantic Coast. Constitutional objections to activity of this sort by the Federal Government, however, were a major deterrent to the carrying out of any such projected plans.

Moreover, the development of routes to open up the West received more interest than the north-and-south highways. Dangers of Indian and French attacks had forced the Colonists to routes through Pennsylvania, Virginia, and North Carolina. A northern one in Pennsylvania passed through Clearfield and Kittanning, and a southern one through Shippensburg and Bedford, both going to Pittsburgh. These were joined at that point by a route going up the Potomac and down the Youghiogheny Rivers. In the South, the early trails and roads, such as they were, converged on Cumberland Gap at the southwestern corner of Virginia. The principal traffic for these routes came from the north through Virginia from Maryland and even Pennsylvania. West from the gap, the route led north to Louisville and south to Nashville. Much of this route was laid out by Daniel Boone, and it became famous as the Wilderness Road. It was the path taken by most of the Colonial migration beyond the Appalachians, and it explains why the principal settlement west of the Appalachians during the Colonial period was in Kentucky and Tennessee.

By 1781 danger from both the French and Indians had been mitigated. As a result, a general development of roads through New York State and in the southern states took place. Again there was a question of what institutions should undertake the development of this expanding transportation system. Many people thought that until the frontier areas became more populous, private enterprise could not be relied upon to project the country's highway system rapidly enough into the West, and they urged that the Federal Government should contribute heavily to the work. The loudest champions of this proposal hoped that the headwaters of each of the major rivers flowing into the Atlantic would be connected by highways reaching westward to the headwaters of cor-

responding rivers tributary to the Mississippi. Here again it was Albert Gallatin who put forth a plan contemplating four major east-and-west Federal roads. But actual Federal appropriations were to fall far below expectations. The Cumberland Road, or National Pike, initially extending from Cumberland, Maryland, to Wheeling, West Virginia, some 130 miles, was the sole project to surmount constitutional difficulties and to rise above the bitter jealousies between states as to what route such a Federal highway should take. This highway was a notable achievement. Finished to Wheeling in 1817, it was built on an ample basis, being 80 feet wide over all with a 30-foot surfaced center. It cost the Government some \$7,000,000.

The failure of the Federal Government to become an active agency in the building of highways in either the East or the West, did not, however, prevent the development of a comprehensive highway system in the country. Local interests, both state and private, in the end acted more effectively than had been anticipated toward creating such a network. One of the most interesting parts of this history is the regional variation in the type of economic institution used in this development. Pennsylvania, plus the states to the north, constituted an area in which the work was left largely in the hands of private enterprise operating on a profit motive. In this area the private corporation with charter rights and obligations given by the states came into extensive use in the highway field. The famous Philadelphia and Lancaster Turnpike Company was the first highway corporation, but by 1800 there were 72 such corporations in the Northern states. A decade later, turnpike and bridge corporations were numbered in the thousands. The corporation provided a vehicle whereby the states could pass on their responsibility for providing highways to an organization which, in return for a promise of interest and dividends, could attract sufficient capital to meet the communities' highway needs. The states, in turn, believed that they had adequate control through charter provisions limiting tolls and rates of return to prevent any injustice to their citizenry. That such an arrangement was usually justified during this period is evident; by 1820 all the major cities in the Eastern and Northern states were interconnected by a reasonably good system of surfaced roads. Yet, active as the promotion of highway development by private corporations was in this period, after 1825 this institution gradually died out. The roads reverted to Governmental custody, under which came a long period of quiet hibernation.

In the South the public turnpike with public trustees or local road commissioners was given preference over roads built by private corporations, in part at least because of the fear that the delegation of state responsibility to private interests might result in the exaction of monopolistic profits. The meager evidence available as to the results of this

arrangement tends to indicate that the technical standards of the highway system of that area were not so high as they were under the corporate systems of the North. The reasons for the existence of a less effective organization for road building in the South are difficult to ascertain. In 1800 the total population of the Southern area was practically as large as that of the North; moreover, the most energetic movements to the west of the mountains had been undertaken from the South rather than from the North. On the other hand, the population of the South was less dense; there were no large cities, and greater emphasis was given to agricultural production. In addition, the local inland settlements appeared to have been organized on a much more self-sufficient basis than those of the North, although this may have been as much a result of the poor transportation system as a cause for it.

The history of highways before the War Between the States can hardly be complete without mention of the plank road companies promoted in Pennsylvania and the Middle Western states during the late 1840's and early 1850's. The proposal to make all-weather farm-to-market roads by using the readily available wood planks as a surface on ordinary roads seems to have made an extraordinary appeal. Small private companies by the hundreds were organized to raise the necessary capital. The speculative incentives for such promotion, building upon the hope of improved local roads, apparently far outran technological possibilities; in fact, by 1860 this whole corporate activity had disappeared with scarcely any trace and with little word as to why it had come to grief.

The actual operation of vehicles over all these various types of highways was carried on by simpler forms of business organizations: individuals, partnerships, or, in some cases, small companies had under their control a number of coaches or wagons. Operations were generally competitive, although on some routes the coach proprietors obtained charters or other special privileges restricting other operators. The general competitive nature of express and freight enterprises contrasted with the monopoly of the highways themselves, which existed because the states refused to charter parallel highways, or because the topography of the countryside prevented closely parallel lines.

Canals

Simultaneously with road building, great activity was shown making the more economical water transportation available in inland regions not served by navigable waterways. The English had shown the feasibility of large canal projects, particularly in the case of the Duke of Bridgewater's successful canal joining Manchester with Liverpool. As was the case with roads, private corporations were used in New England, and initially in New York State, to carry on the construction of canals,

while public organizations undertook the work in Pennsylvania and in the South. By 1800 a scattering of successful canals had been built, including the private Middlesex Canal joining the Merrimac River in New Hampshire to the Boston area, several small private canals in New York State along the route of what was later to be the Erie Canal, the Potomac Canal, and one or two others in the South.

Between 1800 and 1840 canal building became almost a mania. In New York, Pennsylvania, Ohio, and Indiana comprehensive networks of canals were laid out, with trunklines running mostly east and west, joining principal navigable bodies of water and equipped with feeder lines projected into productive areas remote from the trunklines. New York State was one region where these grandiose schemes were carried most nearly to completion. After the private canal construction in the Mohawk Valley area of New York State had failed, the state government took over and proceeded to build the famous Erie Canal. The initial act of the state legislature was passed in 1817, and in 1825 the whole line from the Hudson River to Lake Erie was open for navigation. This canal was 363 miles long, 40 feet wide at water level, and 4 feet deep. It was provided with 84 locks to overcome the rise of 630 feet from the Hudson River to the highest point on the route and the fall of 62 feet from there to Lake Erie. The total expenditure ran to something over \$10,000,000. Somewhat earlier, in 1819, the 76-mile Champlain Canal, providing water transportation to northern New York State, had been finished. As soon as the Erie Canal itself was completed, the construction of branches proceeded. The principal components of the secondary system were a 97-mile canal from Utica to Binghamton, a short branch from a point near Syracuse to Lake Ontario on the north, a series of canals and lakes joining Elmira with the Erie Canal, and a branch 120 miles long from Rochester to Olean in the southwestern part of the state. New York, favored by aggressive leadership completed its main canal system in the early phase of the commercial development arising out of Western settlement, thus garnering a profitable share of the transportation revenues involved in that commerce. Also the topography of the state was such that the engineering problems of these canals could be readily overcome with the engineering and managerial techniques then available. The whole system in the state was built for less than \$20,000,000. The immediate success of the Erie Canal was the guiding light for the canal exponents of other states.

Pennsylvania was a follower rather than a leader, and did not begin its activities until 1826, one year after New York put its principal canal into operation. In contrast to the topography of New York, the mountainous nature of much of Pennsylvania made canal construction far more difficult and operation more expensive. It was, in fact, impossible to complete a through east-and-west canal in Pennsylvania, and

only when the Allegheny Portage Railroad, some 36 miles in length, had been completed did Pennsylvania have a relatively efficient through transportation route from its eastern to its western border. The disadvantages of this route, compared to the Erie Canal, are indicated by the 690-foot rise necessary to reach the portage railroad from the east and the 500-foot fall from the western end of that railroad to the Ohio River.

The young State of Ohio, admitted to the Union in 1802, undertook its program of internal improvement by canal building in 1825, and, the topography being relatively favorable, it was able to forge ahead rapidly. By 1830 it had finished the Miami Canal, running north from Cincinnati 178 miles to a junction with the Wabash and Erie Canal (which completed the route to Lake Erie at Toledo); by 1832 the state had finished a 307-mile canal from Portsmouth on the Ohio River to Cleveland. In addition, in the eastern part of the state, short sections of canals ran west from the Ohio River to the main north-and-south canal going to Cleveland.

This brief account of the canal development should also mention the projected Wabash-Erie Canal that was to join Lake Erie through the State of Indiana to the navigable section of the Wabash River on the western border of the State of Indiana, and the completion by the State of Illinois of the 96-mile Illinois and Michigan Canal, which enabled commerce to flow from Lake Michigan up the Chicago River, then through the canal, and thence down the Illinois River to the Mississippi.

The canal era, covering as it did the first half of the nineteenth century, saw the expenditure, largely by state governments, of something like \$100,000,000. Some of these canals proved to be self-supporting enterprises, whether constructed by private corporations or by the states. The most notable example was the state-built Erie Canal, the tolls from which reached \$1,500,000 in the best years, enabling \$1,000,000 a year to be paid back to the state for interest and for retirement of the canal debt. The secondary feeder canals seldom proved self-supporting, and the later-built main-line canals either were constructed through such adverse territory that expenses were excessive or were undertaken so shortly before the coming of the railroad that they never had a chance to prove their worth.

As on the highways, the vehicles were privately owned. The operators paid tolls for the use of the various sections of the canals and added this expense to the cost of boats, animal motive power, and their labor to determine what should be the profitable charge for passengers and shipments of goods.

Charges for Turnpike and Canal Transportation

A review of the price structure of highway and canal transportation will complete the picture of this phase of inland transportation during

the era before the War Between the States. Speaking broadly, the charges for wagon transportation in heavy-traffic lanes on highways in good condition were in the neighborhood of 20 cents per ton-mile. When road standards were poor or weather bad, the charges were as high as 40 cents. In the direction of light traffic rates were not uncommonly below 20 cents. The tolls assessed for using the highways varied with the type of vehicle and the breadth of its wheels. In the case of the larger four-horse wagons with broad tires, the charges seemed to have varied from 2 to 6 cents per vehicle-mile. Translated into a ton-mile unit, this range would represent a charge of from $\frac{1}{2}$ cent to 2 cents per ton-mile in addition to the wagoner's charges. In the case of the canal boats, the boatman's charges were about 1 cent per ton-mile, to which had to be added the canal toll, which was based on a classification of the freight carried rather than on a uniform ton-mile charge. Summarized in very general terms, the canal tolls varied from $\frac{1}{2}$ cent to $\frac{3}{4}$ cent per ton-mile for raw commodities such as coal and hay, up to 3 cents for more valuable articles such as dry goods and furs. A differentiation was also made between traffic moving in the direction of light flow as compared to that moving in the direction of heavy flow, the latter having to pay frequently twice as much as the former. A third factor in rate making was evident on those canals that were part of through routes from the Atlantic Coast to the Middle West: lower rates were charged for through business than for that which originated or terminated locally. This last differentiation in rate making was obviously in response to the competition provided by the Mississippi River-Gulf-Atlantic Coast routes which had provided a main artery for commerce to the Middle West before the advent of the canal.

The Steamboat

In the midst of the canal-highway era, experiments were made with steam engines as motive power for transportation. Beginning in 1786, a group of inventors which included John Fitch, Robert Livingston, John Stevens, Oliver Evans, and Robert Fulton experimented for some 20 years with the application of steam motive power to boats. In 1807 when the *Clermont* steamed up the Hudson, the steamboat gained general public acceptance. Within a few years steamboats appeared on the Ohio River and shortly thereafter on the Great Lakes, but their adoption into general usage was slow, partly for technical reasons, but primarily for legal ones. Quite early, Fulton and Livingston had gotten a monopoly of steamboat transportation in the waters of New York State and had then extended their power to control steamboats in the rest of the United States. In addition, along the Atlantic Coast, the well-entrenched operators of sailing packets were able to arouse sufficient public opposition so that for a time it was almost impossible for steam-

boat operators to enter a number of the coastal ports. These troubles continued until an aggressive steamboat owner, a Mr. Gibbons of New Jersey, pressed his fight against the Livingston monopoly up to the Supreme Court. In the famous case of *Gibbons vs. Ogden*, written by Justice Marshall in 1824, the navigable waters of the country were finally opened to all.

With the final disappearance of the restrictions to steam navigation and with improved techniques of construction, facilities for building steamboats at the more important points on the Atlantic Coast and inland waterways were soon provided. The whole business of steamboat building and operation was encouraging testimony to the ingenuity and enterprise of American mechanics and businessmen. From 1821 to 1830 some 385 steamboats totaling 65,000 tons were built; while in the decade following 1830, the figure jumped to over a thousand steamboats, with an average tonnage of 175. An inventory taken in 1838 indicated some 700 vessels in operation, with half of the tonnage on the Atlantic Coast or Gulf of Mexico, a third in the Mississippi Valley, and the rest on the Great Lakes. In the next decade, the tonnage constructed was tripled, and for the decade just prior to the War Between the States, the output was doubled again. Technical improvements took place rapidly; more efficient high-pressure engines replaced the earlier low-pressure ones, and in the 1840's the screw propeller was first introduced. The speed and size of ships increased rapidly. The highly competitive nature of the steamboat business brought great pressure to bear on builders to produce fast and luxurious vessels. The best Hudson River boat came close to making 30 miles an hour, and those on the Mississippi River traveled 25 miles an hour downstream and 16 miles an hour upstream.

The vessels were operated by individuals or by associations of share-owners whose holdings sometimes grew to be substantial. Rates and fares were subject to severe competitive pressure, and, in the case of passengers, particularly, there was keen rivalry to provide the best service. The better operators were able to make sufficient profit to increase their fleets by reinvestment and to amass substantial fortunes on the side. Some of them, of whom Cornelius Vanderbilt was possibly the leading example, used every means at hand to establish monopolistic control in certain areas. Although strong-arm methods were frequently used to perpetuate such control, it was never lasting because of the relatively small amount of capital necessary for a new competitor to enter business and because there seemed always to be an enterpriser ready to fight his way into the field. Meantime there developed a clear differentiation for various types of construction, primarily in terms of size and methods of propulsion, and draft. By the 1850's, the usual Great Lakes boat was of 400-odd tons, with some boats reaching

1,000 tons. Boats for the larger rivers ranged around 300 tons, with some as much as 700; while for the smaller rivers, a type of craft drawing not much over a foot was developed and was able to penetrate into the upper regions of these waterways to a degree difficult to realize today.

The historical importance of the initial domination over the commerce of the Middle West of boats operating on the Mississippi and on the 14,000 miles of its tributaries can be no better demonstrated than by the distribution of the centers of population in that area in 1850. Cincinnati, with a population of 115,000, was the biggest city. St. Louis came next with 78,000 and Louisville third with 43,000. Of the western Great Lakes ports Chicago had reached but 30,000 and Detroit, Milwaukee, and Cleveland were in the neighborhood of only 20,000. New Orleans, the outlet of the Mississippi system, could boast of 116,000 inhabitants, whereas Buffalo at the eastern outlet of the Great Lakes had only 42,000.

At the middle of the century about two-thirds to four-fifths of the outbound commerce from the Middle West seems to have moved *via* the southward route of the Mississippi. The inbound traffic, totaling less in tonnage but some 50 per cent more in value than the outbound, seems to have been divided in reverse proportions, the large share moving westward over the canal, rail, and lake routes and the small share up the Mississippi.

Early Railroad Development

The period of discussion and experiment

Just after the beginning of the nineteenth century, three of the men closely connected with the development of the steamboat, Evans, Stevens, and Fulton, began investigations of the technical problems of the railway and the steam locomotive. They gave only slight thought to the use of steam-driven vehicles on the highways; hence the trend of development in the United States entirely by-passed the era of the steam highway carriage which monopolized attention for a number of years in England. It may have been that the existing roads were of such poor quality and our severe winters made them so difficult to traverse for a substantial part of the year that there was little to recommend them for steam coaches. As early as 1810 a number of railway advocates began voicing their opposition to current canal proposals, pointing out that the railroad, though not in an operable state of development, would soon be superior to the canal. Interestingly enough, the first steam railroads to be brought into operation were in conjunction with the canals, the railroad performing the function of traversing the heavy grades which the canal could not undertake.

Early discussions of the relative advantages of railways as compared with turnpikes and canals frequently pointed out that the railway probably could not carry freight for less than 3 or 4 cents a ton-mile, and therefore could not compete with the canals, except for a few goods when transport justified high rates for quick delivery. On the other hand, since passengers were obviously interested in speed and would be willing to pay for the saving of time, it was expected that they would provide the principal business for railroads. A partial explanation of this minimization of the freight-moving possibilities of railroads may lie in the fact that a number of railway advocates had connections with the canal companies. The stand taken by the people interested in the Baltimore & Ohio Railroad was quite different. That railroad was designed to compete with the Chesapeake and Ohio Canal, and hence the promoters of the Baltimore & Ohio Railroad argued that at speeds over three miles an hour, a given pull would move so much more of a load in a freight car than was possible with a canal boat that there could be no question that the railroad was the superior of the two even for freight service.

Another basic question that initially arose in connection with the railroads was whether they would, from the start, be public highways over which anyone could run his vehicles, as was the case with the turnpikes and canals. If the state was to build railways or to delegate its authority in a charter to some private company, it seemed as though it might be desirable to continue the traditional public-highway concept to prevent possible discrimination. This problem was quickly settled, however, by the physical difficulties which arose. It was soon found impracticable to allow each user to provide his motive power and vehicles and operate them at the same time that others were operating them on a single-track railroad.

The beginning of the railroad era

The first common carrier railroad for the movement of general traffic to be opened in the United States was the Baltimore & Ohio in 1830. Such estimates as have been made of the annual rates of construction indicate that in 1830 40 miles of lines were built, by 1835 the annual average was around 200 miles, and by the last years of the decade about 400. All together, in the first 10 years, some 2,200 miles were constructed, of which one-seventh was in New England, nearly two-thirds in the Middle Atlantic States, and the rest in the South. A guess would place the total cost of these facilities at \$75,000,000. During the 1840's something over 6,000 more miles were added to the railroad system with an investment of some \$200,000,000—more, probably, than had been invested during the previous 40 years in turnpikes, canals, and steamboats. The following 10 years saw 22,000 more miles

of line, representing possibly from \$600,000,000 to \$700,000,000 more of capital expenditures. Thus, by 1860 the railroads had become a billion-dollar industry.

Initially, most of the railroads were built as feeders or extensions to existing lines of water transportation. The ports on Long Island Sound and Narragansett Bay, to which steamers from New York plied, had their railroads running inland to tap the hinterland. New York, Philadelphia, Baltimore, Norfolk, Charleston, and Savannah each feverishly projected lines westward to gain control of such commerce as might be developed in the interior. Other feeders were built from the Great Lakes ports of Detroit, Monroe, Toledo, and Buffalo, as well as from river points, such as Madison on the Ohio River, Frankfort on the Kentucky River, Florence on the headwaters of the Tennessee River, and a town on the Illinois River close to Springfield. As the technical improvement of railroads progressed rapidly, their services became more reliable and their range of operation extended. They quickly demonstrated that they were to be something more than subsidiaries to the existing water transportation network. By 1850 a through line had been completed from Albany to Buffalo and another from Detroit to Chicago. Cleveland and Sandusky were tied to Cincinnati by rail, the Erie Railroad reached from the Hudson River at Jersey City to the western part of New York State, and the lines west from Philadelphia and Baltimore extended well into the Alleghenies. Both Charleston and Savannah were connected with Atlanta. By 1855 through train service was available between Boston and New York, and New York was joined by a continuous line of rails to Chicago. Thus by 1860 a substantial network of railroad lines covered the country east of the Mississippi.

Early technological developments

The very early technological development of the railroad had been carried on largely in England. American railway promoters had kept themselves informed of these developments by sending agents to that country to make reports on progress, and they relied initially upon England for their first locomotives, although soon after 1830 locomotives were constructed in the United States. In design, the locomotives used by the American builders were greatly divergent. Railway tracks also were built according to widely varying patterns, and it took some 10 or 15 years for the varying schools of thought on design to come to agreement on generally desirable fundamentals. The acceptance of the cross-tie as a rail support, and the "T" section rail with large heads to take the wear of the flanged wheels came first. By the late 1830's the four-wheel bogie truck provided with metal springs became standard for passenger cars. By 1840 early experiments with compartment and seating arrangements had given way to the "American" type,

with two rows of upholstered double seats without compartmentation, seating some 50 passengers. Longitudinal bunks or berths in tiers had been introduced for sleeping accommodations by 1840, and by 1858 Pullman had introduced his ideas in two experimental cars on the Chicago and Alton. By the early 1850's locomotive design crystallized on the horizontal fire-tube boiler, the front end of which rested on a saddle supported by guiding wheels. Horizontal cylinders rather than the earlier sloping variety became standard design. The cab, attached to the rear of the firebox to protect the engine crew, had already become an accepted fixture. Car axle bearings or journals of the present outside type were universal by 1845, and bearings of soft metal oiled by waste packing were generally adopted by the 1850's. The extent to which the first 30 years of practical operation experience with the railroads was technologically able to produce a basic pattern of design that was to last through the following 80 years to the present is astonishing.

Financing the railroads

While some of the first railroad construction was carried on directly by state governments, notably in the case of Pennsylvania and Michigan, the economic institution used primarily was the private business corporation. The use of the corporation did not mean that the state immediately lost all hold on the railroads. On the contrary, the concept of the relation of the state to its highways was carried over into the railroad field from the earlier turnpike experience, inasmuch as the early railways were regarded as specialized highways. The state retained such charter control over rates, profit, and other matters as seemed necessary, although railroad promoters in turn were pressing for as free a hand as they could obtain. By 1850, however, railroad promoters had become strong enough to have this check on their companies pretty much removed, and hence general charter acts were passed making the grant of the privilege to construct a railroad almost automatic and stripping the state of most of its actual control.

The state governments and local governments played a further role in the early promotion of railroads: they frequently made substantial contributions to the initial capital of railway companies. These contributions might take the form of specific grants of cash or land or purchases of stock or bonds. In Virginia, the state went so far as to apply a standard rule that it would subscribe two-fifths of all railroad stock. In some cases the railroads were granted banking privileges tantamount to a private form of the deficit financing so much discussed today.

In spite of important state aid, the major part of the capital for railroad construction seems to have come from private sources. Because so much of the railroad construction was designed to control the trade

from the hinterland of the port cities, it is not astonishing that the commercial interests of these cities as well as the manufacturers located there contributed capital in substantial amounts. Moreover, the important influence that transportation had on land values made land speculators more than ready to supply credit; in fact, some railroad companies seemed to be primarily land-speculating organizations rather than railroad builders. Not all the capital, by any means, came from American investors; the promised rates of interest and dividends were high enough to attract not only local capital but sizable amounts of European capital. The promoters of these enterprises did not worry much about whether their money came from government or private sources just as long as the flow was ample.

Quite early in railroading, the professional promoter played an important part in bringing about railroad construction. He was not interested primarily in developing the commerce from the hinterland or in improving the communications of the country; he was concerned with making a fortune for himself in the course of the initial financing and the construction of a railroad. His influence was especially felt in the Middle West, although there were instances of his operations in the Eastern states, even Massachusetts, where railroad financing was generally on the most conservative basis. His operations did much to upset the theoretical notion that stock represented the holdings of entrepreneurs who took the big risks in developing new projects and who therefore should be given ample return. For, actually, the promoter was quite careful to see that the bondholders were the ones who put up the cash and, to a considerable extent, unknowingly carried the real risk, for which they received a relatively low and fixed return. He, the promoter, got most of the stock for supplying temporary working capital, and thus he acquired a claim to whatever profits might be forthcoming, at little or no expense or risk to himself. Procedures of these types were sometimes concealed by creating a promoter-controlled construction company which took both bonds and stock as payment for the work that it did, selling the bonds at a discount to raise cash to cover construction expenses and holding the stock for itself as a bonus. It was this sort of manipulation that made for instability of railway finances and, unfortunately, attracted the financial manipulator after a railway had been put into operation.

The meteoric rise of the railroad to the position of the largest single industry in the country, together with the promotional and manipulative weaknesses that it fostered, made the railroads a key factor in the rise and fall of business activities. Undoubtedly, the discovery of concealed losses in the Eastern Railway of Massachusetts and of the defalcations of the president of the New York and New Haven Railway, both coming in 1854, precipitated the financial panic of that year. Railroad build-

ing certainly produced a dangerous expansion of credit, a fact made abundantly clear three years later in the panic of 1857.

Charges for railroad service

The charges which the railroads made for their services in the first 10 or 20 years of their history varied widely between different companies. About 1840 the average revenue per ton-mile ranged from 4 to 10 cents, and passenger fares from 3 to 8 cents a mile. The higher charges seem to have been made under conditions of little competition. A number of quarters felt definitely that high rates should be exacted even to the point where some adverse feeling was created. It was only begrudgingly admitted that "to a certain extent, reduction of cost of freight and travel does stimulate increase of receipts in income." A few scattered companies, primarily in the East, believed that low charges would in the long run stimulate sufficient traffic to justify reduction; a leader in the latter school of thought was the Baltimore & Ohio.

Actually, the nature of railroad growth, especially as lines became longer and came into competition with one another and with steamboats and canal operators, had more influence on the trend of rates than did any rate theories held by railway executives. By 1855 competitive pressure had reduced freight rates to a figure centering around 3 cents per ton-mile, while passenger fares were in the neighborhood of 2 cents per mile. The downward trend in freight rates continued gradually, reaching levels in many cases of approximately 2 cents by 1861.

The theory of rate making held most widely during these years followed the principle of "charging what the traffic will bear." The statements of Charles Ellet, Jr., a contemporary canal and railroad engineer, may be taken as typical. According to Ellet, total charges should be "proportional to the abilities of the article to sustain" them and in accord with "the greatest tax for carriage which the commodity will bear." He was bold enough to suggest that the optimum rate of profit should be 100 per cent of expenses. This rate of profit might have to be modified downward as hauls became longer, because the traffic could not bear the consequent high charges. He criticized some of the existing rate scales as follows: "At the distance of one hundred miles from the mart, in the usual tariffs a commodity is charged one dollar where it might bear a charge of three, and at three hundred miles it is charged three dollars where it could bear but one." Such reasoning obviously assumed a complete monopoly of transport by the carrier making such rates, as is verified in the part of his theory that called for modification of "ideal" rates downward where water competition existed.

Transportation in Relation to Location of Economic Activity

As already noted, transportation was quite primitive and expensive compared with modern standards during the first 50 years of our history. Traffic moved slowly and uncertainly, compared to present standards. Yet during these same years water transportation, available first on natural waterways and later on canals (supplemented by high-cost highway operations), made possible an astonishing redistribution of population and economic activity. Migration to the West and the development of resources in that area proved quite possible with transport facilities existing at that time. Indices of the distribution of population show, for example, that in 1790 a negligible proportion of the population lived west of the Appalachians. Yet 50 years later, before a single railroad had penetrated that area from the coast, some 40 per cent of the nation's people lived west of New York, Pennsylvania, and the coastal states of the South. The center of population had moved during these years from a point 25 miles east of Baltimore to a spot almost on a line with the western border of Pennsylvania.

The limitations of early modes of transportation appear in respect to the specific location of economic activity rather than in the general dispersion of population. Within the western area, for instance, commercial centers before 1850 were founded almost exclusively on the waterways. In 1820 Cincinnati, on the Ohio River, was the only city with a population of over 1,000 in the state. By 1840, largely as a result of the development of Ohio's canal system, Dayton and Toledo, on the Maumee Canal, and Cleveland, Columbus, and Canton, on the Ohio-Erie Canal and its tributaries, could all boast of populations over 1,000. Another indication of the importance of water transport for urban growth was the fact that in 1840, of the country's largest cities, the first five in order of size were coastal ports and the next five were river ports—four on the Mississippi system and one 150 miles up the Hudson.

Technical factors associated with water transportation were effective before 1850 in changing the direction and channels along which long-haul traffic moved. During the first quarter of the century, the products of the Middle West moved chiefly along the Mississippi River and its tributaries. The Erie Canal diverted a major part of this traffic to an east-west channel. That it did not make even greater inroads may be attributed to the development of the Mississippi River steamboat.

In spite of the opposition of vested interests in water transport, most of the localities owing their original development to navigable water facilities were among the first centers to attract railroad service. Much of the Erie Canal route was paralleled by a railroad at an early date.

The first railroads of Ohio were laid out to join already established points like Cincinnati, Columbus, and Cleveland. The first railroad across Michigan started from the Great Lakes ports of Monroe and Detroit. Railroads in theory might well have led to the establishment of important dry-land intermediate centers, but the practice of quoting lower rates for centers served by water than were quoted for dry-land points placed definite restrictions on any such development.

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CHAPTER 10

The Processing of Agricultural Products in the Pre-Railway Age

PROCESSING means subjecting materials to a process of manufacture, development, or preparation for the market; converting something into marketable form, as livestock by slaughtering, grain by milling, cotton by spinning, milk by pasteurization, fruits and vegetables by sorting and packing. There are four main types of processing. (1) In some industries, such as the refining of sugar, an *extractive* process is involved in which, mainly by the application of heat, the refined product is extracted from the raw. (2) Meat packing is an *analytical* process in which a basic raw material is disintegrated or decomposed into several different products. These end products may consist of one or more main products and dozens, or even hundreds, of by-products. (3) In the *synthetic* or assembly process several elements are combined to make a single product. The baking of bread serves as an example of this type of manufacture, for flour, sugar, dry milk, solids, and shortening are combined with other ingredients to produce the end product. (4) Finally, there are industries engaged mainly in changing the shape, texture, form, or size of the material on which they operate. These are called *converting* industries. A creamery, churning cream into butter, would fall into this classification.

Extent and Variety of the Agricultural Processing Industries

A quick survey will show the extent and variety of these industries. Some are based on the cereals: wheat, corn, oats, barley, rice, and so forth. These provide raw materials for flour milling, baking, the manufacture of cereal breakfast foods. From corn come whiskey and alcohol, as well as starch, corn syrup, and a multitude of other products. Second, there are the industries based on animal husbandry, including the production of dairy products: creameries producing butter, cheese factories, plants producing condensed and powdered milk, and ice cream factories. The raising of sheep and goats provides raw material for textile mills. Cattle hides form the basis of the leather industry; and cattle, hogs, and sheep of the meat-packing industry. Poultry and eggs must undergo some processing before they are ready for the market,

and so also must fruits and vegetables, which have in recent times become the mainstay of the canning industry. In the third place are the vegetable fibers, cotton and flax especially, that form the basis not only of textile industries but of the manufacture of other products: linseed oil from flax, cottonseed oil from cotton, and various other vegetable oils. Still other crops give rise to such industries as the refining of sugar, the roasting of coffee, the manufacture of cigars and cigarettes, as well as the making of various alcoholic and nonalcoholic beverages. Lastly, mention may be made of the rubber industries so prominent in public discussion today, since these are obviously agricultural processing industries.

Many of these activities did not exist 200 years ago; needs were few and easily satisfied. The industries of those days were carried on quite differently from those of today. It is worth while to study their development from their early beginnings to their present stage, but only the more important and more representative industries will be analyzed in this chapter.

Stages of Development in the Agricultural Processing Industries

Some general features of their development should be discussed before the several processing industries are taken up for separate treatment. On the pioneer farm grinding grain into meal, baking bread, slaughtering livestock to provide meat, preserving vegetables, making clothing, cutting firewood, and sawing logs into lumber were at first all carried on for household consumption. The farmer provided his own raw material, performed the processing activities, and owned the finished product.

Most of these processes were carried on in the home by members of the family. As settlements grew, skilled workmen began to devote all their time to processing. They were often itinerants who traveled from one farm to another to make shoes or clothes, or to slaughter the farmer's meat supply. Even when the need for mechanical power was met by the erection of a village gristmill, the pioneer farmer often had to assist the miller in grinding the grain. The miller took his toll and gave back the remainder to the farmer who carted it home for his family's use.

As villages grew into towns, many itinerant workers settled in them, built small shops, began to purchase raw materials and sell the finished products. They worked mainly with hand tools and sold most of their products directly to the consumer. By 1700, according to a writer of that time, 51 manufacturing handicrafts, besides the building trades, were carried on in Philadelphia.¹

¹ V. S. Clark, *History of Manufactures in the United States*, Vol. I, p. 164. New York: McGraw-Hill Book Company, 1929.

Probably most production before the Revolution was in one of these two stages. Those industries or producers that had reached the point of manufacturing for export were in a third stage in which "goods are made by one set of persons, marketed by another, and consumed by a third."² Manufacturing was still typically by hand, but the processed goods were sold to wholesalers, who in turn sold to distant retailers. Wholesalers were to be found in the principal seaports of all the Colonies at the close of the Colonial period. They sold to the country stores products imported from Europe, the West Indies, and other colonies; and purchased from them the commodities that the country storekeeper had accepted from the farmers and that were suitable for sale in the coastal towns, or in Europe and the West Indies. The miller, the tanner, or the meat packer who had surplus products that he was unable to sell in his immediate locality, was also glad to avail himself of the services of these merchants. For example, the Brandywine millers at the close of the Colonial period were manufacturing mainly for export and were marketing their flour through exporters.

Rise of the Meat-Packing Industry

Once the early settlers of America had established themselves in the new land, they sent to the mother country for the cattle, sheep, and swine with which they were familiar. Before long, these animals had increased in numbers sufficiently to provide an important part of the American food supply. A writer of 1650, speaking of the town of Ipswich, Massachusetts, said, "The Lord hath been pleased to increase them in Corne and Cattell of late, Insomuch that they have many hundred quarters to spare yearly, and feed, at the latter end of the Summer, the Towne of Boston with good Beefe."³

At first, in every community, each farmer was his own butcher. After the harvest was over and the cold weather had set in, several hogs and perhaps a steer were killed to provide the winter's supply of meat. The meat that was not eaten fresh was smoked or cured with salt, a procedure followed by pioneer farmers, and, indeed, by many families beyond the pioneer stage, all the way from the Atlantic to the Pacific.

As population increased and villages grew into towns, men began to specialize in the butchering trade. Itinerant butchers traveled from farm to farm to slaughter for the farmers. After a time many settled in the growing towns and became meat dealers as well. They set up slaughterhouses at the edge of the inhabited area, bought animals from the farmers, and sold fresh meat to the community over the counters

² N. S. B. Gras, *Industrial Evolution*, p. 25. Cambridge, Massachusetts: Harvard University Press, 1930. The first four chapters of this book provide an interesting and valuable analysis of the evolution of manufacturing in England and America up to the pre-factory stage of development.

³ Edward Johnson, *Wonderworking Providence of Sion's Savior in New England* (J. F. Jameson, ed.), p. 96. New York: Charles Scribner's Sons, 1910.

of their little shops. Sometimes they peddled it from house to house.

Much of the meat had to be cured in some way because it could not be sold fresh. Moreover, in seaport towns quantities of meat had to be prepared for the crews of fishing boats and other sailing vessels, and for export to foreign markets. The farmer had preserved his winter's supply by smoking the meat or salting it. For the overseas trade, however, it was necessary to pickle the meat in brine and pack it in barrels. Thus there arose the term "packer": one who packs meat in barrels. It is still customary to speak of the men who furnish our meat supply as "packers," although today packing in its exact sense is a minor branch of the meat industry.

Packed meats for the export trade came from a variety of sources. Farmers and planters who slaughtered their own animals brought to market the excess not needed by their families. Merchants took livestock in exchange for foods and had it killed and packed by men who made a specialty of this business. Some packers were themselves dealers in cattle and provisions, combining in their own hands both manufacturing and merchandising.

Something of the way the packing business was carried on in the larger cities at the end of the Colonial period is pictured by the advertisements of Robert Hewes of Boston in the *Massachusetts Centinel*. Hewes operated a slaughterhouse, a salting house, and a factory for making glue, soap, candles, and starch. He also had a shop in which he sold soap, glue, neat's foot oil, candles, starch, and hair powder, presumably all of his own manufacture. He purchased and killed livestock for local meat markets and killed and sold livestock for farmers. Other enterprises of this type also repacked salted meat for export. The scale of operations is indicated by the records of the largest packer in New England, who in 1790 put up 5,000 barrels of beef for foreign markets.⁴

In cities like Boston growth of population combined with growth of shipping and exporting to enlarge the meat trade. The Boston market demanded a larger supply of animals than the farms of the neighborhood could supply. As early as 1654 William Pynchon drove cattle overland from the Connecticut Valley to Boston.⁵ Thus the cattle drovers originated. Their functions arose from the fact that the principal areas of livestock production were so far removed from the centers of population, since then and in later times cattle raising flourished where unoccupied lands offered free range. The drovers therefore traveled from farm to farm, collecting cattle and hogs until they had obtained a suffi-

⁴ Clark, *History of Manufactures in the United States*, Vol. I, p. 482.

⁵ William Pynchon was also the first regular packer, packing hogs for export to the West Indies. R. A. Clemen, *The American Livestock and Meat Industry*, p. 323. New York: Ronald Press, 1923.

cient number to drive to market where the animals were sold to the butchers and meat packers.

Originating in New England, this practice was soon adopted in the Middle and Southern Colonies, where cattle and hog raising flourished most in the back country, in the Great Valley of Pennsylvania, the Shenandoah Valley, and the Piedmont region of the Carolinas. In this territory the settlers created cattle ranches, an open range, and a cow country similar to the later development of the Great Plains. New York, Philadelphia, and Baltimore became packing centers and live cattle began to be exported from Charleston. During the Revolutionary War "great herds of fat cattle were driven from these choice pasture lands to the markets at Charleston, Baltimore and New York."⁶

Concentration of meat production in these cities brought the rise of related industries such as leather tanning, soap making, and the molding of tallow candles. Marketing methods changed as markets and fairs were organized to assure a meat supply for the larger cities. The Dutch in New Amsterdam, for example, established two fairs held each fall: one for cattle and another for hogs. Apparently they were insufficient, for in 1656 a market space was set aside and a weekly market was instituted by the Governor. Similar fairs and markets were established in Philadelphia, Hartford, New Haven, Providence, and other cities. Drawing livestock from distant farms and ranches, they caused a growing centralization of slaughtering and meat packing. Outside of Boston stockyards and cattle pens were built where sellers could show their animals and buyers could inspect them, but Faneuil Hall in the business district provided a meeting place for the sale of livestock.

When cattle and hog raising developed beyond the Alleghenies after the Revolution, this system of markets and fairs was copied. All through the Ohio Valley fairs served as points of concentration at which drovers or packers might obtain a sufficient number of animals for their needs. The farmers of the Ohio Valley early developed a surplus of cattle and hogs that they disposed of in several ways. Some of them did their own slaughtering, selling the meat in near-by towns. A country storekeeper might gather a boatload of animals from farmer-packers to ship down-river to the New Orleans market.

Before the development of the canals and railroads, however, most of the cattle and hogs raised for distant markets were driven "on the hoof" to Atlantic Coast markets. Three routes were followed: the northern to New York, the middle to Philadelphia, and the southern to Philadelphia or Baltimore. "During the summer along these lines of travel so many drovers passed, that an observer a mile or more away,

⁶ Joseph Schafer, *The Social History of American Agriculture*, p. 96. New York: The Macmillan Company, 1936. A good description of the development of cattle ranching from Colonial times is found on pp. 90-106.

could know of the passing of the stock, for up in the air he could see long moving lines of rising dust."⁷ Seldom were there less than one hundred head of cattle in a drove; droves of hogs were often many times as large. Fat cattle could cover seven miles a day, hogs somewhat less, so that the journey was often a protracted one. Frequently the cattle were sold, just before they reached the market, to farmers who fattened them and sold them again at a profit.

This system of droving declined when slaughtering and meat-packing centers arose in the West. By 1850 it was said that there were a hundred towns in Ohio, Indiana, and Illinois engaged in the business. Of these, Cincinnati offered outstanding advantages. Large supplies of capital were available through Cincinnati banks. Fortunes acquired in Boston packing houses were invested in Cincinnati establishments.⁸ The Ohio River and its tributaries provided transportation into the livestock areas and to distant markets. River navigation was supplemented by canals and railroads. As early as 1818 Cincinnati had become a recognized center; and by 1832 a contemporary writer could state, "Cincinnati is decidedly the largest pork market in the United States." In a new country, it was found that hogs could be raised more easily than cattle: they reproduced more rapidly, needed less care and attention, and could protect themselves against wild animals better than cattle and sheep, although they were unable to stand long journeys over mountain roads as well as cattle. Hogs could be slaughtered and their meat smoked or cured by relatively unskilled labor; moreover, the meat was as palatable in the form of salt pork, bacon, or ham as when it was fresh. All this favored the establishment of pork packing west of the mountains.

In Cincinnati in the earlier years, and generally in other centers, the slaughtering was done by farmers. Meat was sent to commission merchants in the city who packed and marketed the products. As the trade developed, merchants found it safer to buy live hogs because the farmers often handled the meat carelessly so that much of it was spoiled. Rather than do the slaughtering themselves, the merchants turned over the animals to butchers operating slaughterhouses on the outskirts of the city. From the slaughterhouses the carcasses were hauled across the city to the packing houses on the river bank, where the meat was smoked, cured, or pickled, and packed in barrels.

The slaughterhouses had, by 1840, developed a considerable division of labor and were also learning to profit from by-products. The cheaper fats were rendered into lard oil, which superseded whale oil as the illuminant in poor men's homes. Soap and glue factories were estab-

⁷ King, "The Coming and Going of Ohio Droving," *Ohio State Archives and Historical Society Quarterly*, Vol. XVII (1908), pp. 247-253. Quoted in P. W. Bidwell and J. I. Falconer, *History of Agriculture in the Northern United States*, p. 178. Washington: The Carnegie Institution, 1925.

⁸ Clark, *History of Manufactures in the United States*, Vol. I, p. 482.

lished, as were plants for making hog bristles into brushes.⁹ In 1849 the cooperage industry in Cincinnati and its environs employed 1,500 men, most of whom were engaged in making kegs, pork barrels, and bacon hogsheads for the packing industry. By 1850 concentration of ownership had brought packing and slaughtering under a common management. Hand labor still predominated, and much working capital was required because of a delay of from six to eight months between the purchase of the livestock and the sale of the finished product. It was for this reason that Cincinnati's banking facilities were so important. The length of time that elapsed between purchase of livestock and sale of finished product, together with the unpredictability of prices, made the business highly speculative. For the packers the transition from prosperity to absolute bankruptcy was often very sudden.

The market that Cincinnati built up for its products was catered to with great discrimination. England, Germany, New England, the merchant marine, the navies of America and Europe, and the plantations of the South and of the West Indies consumed the varied products that Cincinnati prepared for them. The city's rapid growth in population provided an ample labor force. Subsidiary industries and services—trucking, cooperage, and so forth—also developed. Although their nearness to supplies of livestock and their transportation advantages led other cities, such as Louisville, Alton, and St. Louis to take up meat packing, Cincinnati remained without a peer up to 1850. In 1833 Cincinnati firms packed 85,000 hogs; in 1848 nearly 500,000. There was both humor and admiration in the statement of a contemporary writer that Cincinnati was "the most hoggish place in the world."¹⁰

After the War Between the States Cincinnati had to yield leadership to Chicago. That city was developing in the 1840's as a market for beef-cattle. The *Chicago Tribune* in 1845 was "inclined to believe that Chicago was destined to become the greatest beef market in the United States, if not in the world."¹¹ That development was delayed until the perfection of mechanical refrigeration and the refrigerator car made it feasible to market fresh beef all over the country. Meanwhile, however, pork packing advanced rapidly in Chicago, especially after the opening of the Illinois and Michigan Canal (1848) and the growth of the railroad network centering in Chicago. The spread of the Corn Belt across the Mississippi made Chicago rather than Cincinnati the logical market for the larger part of Middle West hog production. By 1860

⁹ In 1847 it was stated that Cincinnati packers could pay higher prices for hogs than those at other places because of their income from by-products. Clark, *History of Manufactures in the United States*, Vol. I, pp. 483-484.

¹⁰ *DeBow's Review*. Quoted in Edward C. Kirkland, *A History of American Economic Life* (rev. ed.) p. 299. New York: F. S. Crofts Company, 1939.

¹¹ Quoted in Bidwell and Falconer, *History of Agriculture in the Northern United States*, p. 393.

it was Chicago rather than Cincinnati that had become "pork-butcher of the world."

The Leather Industry

From the hides and skins that were by-products of the packing industry arose the leather industry so important in Colonial days. In every Colony pioneer farmers found it necessary to preserve hides and skins for clothing and for other uses. Leather was used not only for shoes, but for coats and breeches, for gloves, belting, harness, upholstery, book-binding, and a multitude of other purposes.

Hides in the natural state are fairly durable if kept dry. But centuries ago savages discovered that if the brains and other fats of the animal were rubbed into a skin, it could be preserved for a far longer period.¹² Later it was discovered that tannic acid derived from the bark of hemlock, oak, or chestnut trees worked the same effect. At the outset most pioneer farmers doubtless did their own tanning, since equipment and processes were simple and inexpensive. From the leather they made their own shoes and leather garments as well.

But although "almost any pioneer could manufacture leather, it took a skilled man to produce good leather."¹³ In response to the great need for a superior product artisans soon set up tanneries and engaged in leather manufacture in every Colony. Most of these tanneries were on a very small scale. Even the more successful establishments represented but a small investment—two or three thousand dollars in raw materials, much less in buildings and equipment. A site alongside a running stream, a number of vats sunk in the ground and others (for liming) above ground, an open shed for a beamhouse, and a bark mill in which water or animal power was used to grind the bark were all that was necessary. Processes, too, were simple. The vats were filled with alternate layers of bark and hides and then covered with water. The tannic acid leached from the bark and impregnated the hides, which were turned from time to time and moved into other vats so as to expose the hides to liquor of varying strength. Since the process required almost a year a considerable amount of capital was tied up in the hides. The bark used depended on the locality. New England tanneries used hemlock; the Southern tanneries, oak. Hemlock produced a lighter leather so that a considerable interchange arose between the Colonies.

In most of the Colonies the Government encouraged tannery and related industries by laws forbidding the exportation of hides; other

¹² And this was good leather. As made by the American Indian, it has never been surpassed by the white man in spite of his superior technical knowledge. Malcolm Keir, *Manufacturing*, p. 428. New York: The Ronald Press, 1928.

¹³ Keir, *Manufacturing*, p. 429.

laws provided for public inspection of leather.¹⁴ An effort was made to prevent men from carrying on a combination of tanning, currying (finishing leather), and shoemaking in one enterprise. Apparently such laws were not successfully enforced.

Salem and Lynn, Massachusetts, have been looked upon as the birth-places of leather manufacture in this country. There were, at the end of the Colonial period, many small tanneries in or near those cities. As the supply of bark ran low in this area the industry moved westward into regions of undepleted timber, since the availability of the bark rather than of the hides determined the industry's location in those days. Hides, after being partly dried, could be transported long distances, whereas bark crumbled easily and was hard to transport without waste and loss. So the tanning industry spread westward into the hardwood regions of Pennsylvania and the Ohio Valley.

Other than this westward movement, no important changes took place in the industry until after the War Between the States. Some new tanning materials were developed; imported hides and skins were depended on more and more. Meantime, tanneries multiplied rapidly until by 1870 there were 4,500 in operation. But the great changes that were to modernize the industry in technique, scale of operations, and organization came after that date.

The Development of Flour Milling

The English settlers of the Atlantic Coast brought with them their English grains—wheat, rye, oats, and barley—and planted them beside the Indian corn. Soon these grains yielded large returns. At first the settlers ground grain in their homes. The more fortunate families had brought small hand mills with them; the less fortunate learned to crush the grain Indian-fashion with a hominy block and a wooden pestle.

As population grew, power mills became a necessity, since labor was scarce. In Massachusetts a windmill at Cambridge ground grain as early as 1632. In 1643 the exclusive right to grind corn for the public of Boston was offered to anyone who would build a tide mill. Later mills utilized the power of the smaller streams by means of dams or sluices. Such mills had become quite common in New England by the end of the seventeenth century. In New York City the first mill, set up in 1626, was operated by horse power although in that Colony windmills were also popular. In Pennsylvania and Maryland water-power mills were built before 1650. Probably the earliest mill of all was erected in Virginia. The records of the Virginia Company show that a windmill

¹⁴In some Colonies the export of leather was also prohibited for the protection of the shoemakers. See Clark, *History of Manufactures in the United States*, Vol. I, pp. 53-56, for a summary of these regulations.

had been completed and a water mill was in course of erection in 1621.

These early mills were small and crudely constructed with the limited capital available.¹⁵ Only the smallest streams could be dammed. Sometimes an undershot wheel set in the current of the stream made a dam unnecessary, although such a wheel gave but a small amount of power. Many of these mills had no machinery other than the millstones. A farmer dependent on such a mill had to carry home his meal and sift out the flour by hand. A definite advance came when the mills installed cylindrical bolting machines to do the sifting. Often this apparatus was turned by hand and the farmer who brought in his grist had to do the turning. One man, the miller himself, usually constituted the labor force of such mills as these. Because the stream might dry up during the drought of summer, or freeze up in winter, the miller often fell back on other occupations and other sources of income. A famous Philadelphia miller, for example, operated a farm, a distillery, and a sawmill, as well as his flour mill.¹⁶

The typical Colonial mill took the farmer's grain and ground it, returning the identical grain to the farmer minus a toll to cover the cost of grinding. The miller might consume the toll-flour himself or he might sell it. Once he got into the way of selling flour it was natural for him to take the next step: buying wheat and manufacturing for sale. Then the gristmill became a "merchant-mill." Many of these merchant-mills catered especially to the export trade. By 1792 American mills exported 824,000 barrels of flour, mainly to the West Indies and to southern Europe.¹⁷

By the time of the adoption of the Constitution, power mills were common in all the Colonies. Almost every farmer grew some grain for his family food supply, if not for a cash crop. The difficulty and high cost of transportation multiplied the number of mills. Said Thomas Jefferson in 1786, "There is no neighborhood in any part of the United States without a water gristmill for grinding the corn of the neighborhood."¹⁸ There had developed, however, a fairly distinct wheat belt in which wheat was grown as a staple crop so that a large surplus was made available for export. In this belt, reaching from the Mohawk Valley southward through Pennsylvania into Maryland and Virginia, was the largest concentration of merchant-mills. In Philadelphia and on the Brandywine Creek near Wilmington were located the chief mills of that period. Hundreds of Conestoga wagons hauled grain to them

¹⁵ For a description of milling processes and machinery in Colonial times see C. B. Kuhlmann, *Development of the Flour Milling Industry*, pp. 93-96. Boston: Houghton, Mifflin Company, 1929.

¹⁶ François de la Rochefoucauld, *Travels Through the United States*, Vol. I, pp. 101-104.

¹⁷ Tench Coxe, *View of the United States*, 413-417. Philadelphia, 1814.

¹⁸ Andrew A. Lipscomb (ed.), *The Writings of Thomas Jefferson*, Vol. V. Washington, D. C.: Thomas Jefferson Memorial Association. p. 403.

from distant farms. Large shipments of wheat were floated down the Delaware, the Schuylkill, and the Susquehanna Rivers to the millers' docks.

Because the mills produced a necessity of life, they were, from the first, subject to Government regulation and control. The Colonies encouraged building of mills, often by granting a monopoly in a community for a term of years. The export of wheat was forbidden at times in order to conserve the supply; in some Colonies bounties were offered for flour manufacture. Other regulations, perhaps, were not so pleasing to the millers. Their toll was fixed by law. In certain regions they were required to grind for custom on certain days. Government officials inspected all flour intended for export to see that it was full weight and not adulterated. In Virginia the inspectors also graded the flour, marking it "Fine" or "Superfine." Each barrel had to be branded with the name of the mill and its owner.¹⁹

Just after the Revolution a period of rapid technical improvement in flour milling was induced by the inventions of Oliver Evans. He tells how he undertook to build a mill on Brandywine Creek in 1782: "I then began," he says, "to study how I could make the mill exceed all others. I first conceived the grand design of applying the power that drives the millstones to perform all the operations which were hitherto effected by manual labor." And so he developed a series of improvements: a conveyor that moved the meal horizontally from one machine to another, an elevator that moved it vertically from one floor of the mill to another, and a "hopper-boy" that spread the flour for cooling. In 1791 he was granted a patent on his inventions. They were installed in some of the Brandywine mills where they quickly demonstrated their usefulness and whence their fame spread to other mills over the country. Their main advantage was that they saved labor. A mill that made 40 barrels of flour a day had required four men and a boy to operate. Now, with Evans' improvements, two men were sufficient.²⁰ But the new machinery required larger amounts of power and cost more to construct. More capital was therefore needed, and the industry was transformed to a capitalistic basis. The larger merchant-mills using the Evans equipment could operate at a lower cost per barrel, and thus the large mills flourished and the smaller mills failed.

This trend, in turn, led to the localization of the industry in favorably situated milling centers. The mills of the Brandywine lost the leadership to those of Baltimore early in the national period. Possibly the Baltimore millers were somewhat more progressive than those of the

¹⁹ For a summary of Colonial regulations see Kuhlmann, *Development of the Flour Milling Industry*, pp. 10-14, 20-21, 31-32.

²⁰ Oliver Evans, *The Young Millwright and Millers' Guide*, 9th ed., p. 239. Philadelphia: Carey & Blanchard, 1836.

Brandywine and therefore more easily persuaded to adopt the Evans inventions. At any rate, the most famous Baltimore millers—the Elliccotts—were soon won over to their use. Then, too, Baltimore had valuable water power and access to the finest wheat supplies of Maryland, Pennsylvania, and Virginia. After the Baltimore and Ohio Railroad was built, the mills of Baltimore could secure cheap wheat from the Ohio Valley. Baltimore was then the country's leading seaport for trade with South America, and large shipments of flour were sent annually to Brazil as well as to Great Britain and the West Indies. At home, Baltimore developed a flourishing flour trade with the cotton states to the south. By 1850 the mills of the city were producing 500,000 barrels of flour and an equal amount came to the Baltimore market from mills in the surrounding area.

Richmond, gaining importance as a milling center, about 1820, ranked second to Baltimore. Its activities centered in the mills of Gallego and Haxall. Its chief advantages were the water power provided by the James River and the wheat supplies of the interior valleys of Virginia. The Richmond mills were the largest of the time. The Gallego mill could turn out 900 barrels of flour a day; the Haxall, 700. Thus they were the first to prove the advantages of large-scale production in milling. But Richmond lacked the fine harbor and the foreign trade organization that Baltimore had developed so successfully. The War Between the States cut off her foreign markets, while the competition of the Western millers delayed recovery of lost ground.

Rochester rose as the third milling center of the East. The Genesee River afforded plenty of water power for many mills. When the Erie Canal was put into operation, it supplied an outlet to the New York City market, and, in addition, enabled the Rochester mills to supplement their local wheat supplies by drawing from the Ohio Valley. Moreover, the Rochester mills were large, efficient, and well equipped. By 1850 they were producing almost as much flour as the mills of Baltimore, and more than those of Richmond. After 1870, however, they too began to feel the pressure of competition from the Western mills, which held a superior position because railroad rates of the time favored shipments of flour more than of wheat. Even the local wheat supplies were failing the Rochester mills, as Genesee Valley farmers turned from staple wheat growing to diversified farming.

By 1870 St. Louis had become the most important milling center. Its development had begun before the War Between the States. In 1841 there were but two mills in the city; by 1851 there were 19. This growth was all the more remarkable because St. Louis has no water power. No other city, however, is better situated for river navigation, which, combined with a network of railroads, forms a superlative transportation system. St. Louis millers took advantage of their location

to secure very low rates for their flour shipments. The Gulf States became a subsidiary market. St. Louis flour rapidly conquered the New York market as well. The soft red winter wheat produced in the territory tributary to St. Louis was conceded to make the best bread flour, and the marketing organizations set up by the St. Louis Exchange enabled her mills to get the best wheat at lowest prices.

Beginnings of the Canning Industry

The art of preserving food by sterilizing it with heat and enclosing it in airtight receptacles is generally said to have been perfected by a Frenchman, Nicholas Appert. (Canning in his day would have been a misnomer, since he used glass jars; tin cans came somewhat later.) In 1809 Appert was awarded a prize of 12,000 francs by Napoleon for his success in developing a workable process of food preservation. He had spent 15 years in perfecting it. For centuries man had tried to preserve foods by drying, salting, and smoking. They had been successful only with meats, fish, and a few fruits. Sailors on long voyages ate little but hardtack and salt meat. The shortage of vitamins caused many deaths from scurvy. To supply the needs of the French Navy for a more adequate diet, Napoleon had offered a prize for a successful method of food preservation, with the stipulation that the winner explain his process in a book so that the public could learn how it was done.

Appert had devoted a lifetime to preparing foods. He had worked as a pickler, preserver, wine-worker, confectioner, brewer, distiller, and army contractor at various times. Although he had had no scientific education, he worked out a process that was scientifically sound. Its axiom was that food sterilized with heat and enclosed in airtight receptacles would keep for long periods of time. Heat is the great natural sterilizer.

Appert's treatise, "The Book for All Households or the Art of Preserving Animal and Vegetable Substances for Many Years," was published in 1810. An English translation some years later spread the knowledge of the new method to English-speaking countries. One of his successors developed a closed vessel for steam-pressure cooking and a gauge for measuring the temperature that greatly improved the process. By 1820 canners were beginning to use tin cans instead of glass jars, and canning as it is now known came into being.

Even before Appert's book was published American experiments were being made.²¹ It was in England, however, that the new process

²¹ The Swedish traveler, Peter Kalm, who visited the American Colonies about 1750, described a process used in New York to preserve oysters and lobsters. According to his account, they were washed and boiled and put up in glass or earthen jars "well stoppered to keep out the air." *Travels into North America*, Vol. I, pp. 185-187.

made the most rapid progress, which may explain why the first important canneries in the United States were started by men of English birth. William Underwood is said by some to have been the first American canner. English-born, apprenticed in his youth to the pickling and preserving trade, he came to America and settled in Boston in 1819. By 1821 he was shipping fruits and berries in glass jars to South America and the Orient. The bottles had to be imported from England. Lobsters and tomatoes were put up, as well as fruit. Apparently Underwood at first met with little success in his home market, which preferred English canned foods. Even his shipments to foreign ports are said to have carried a London label.

At about the same time, another Englishman was getting a start in New York City. Thomas Kensett came to America after acquiring some experience in pickling and preserving food in England. Settling in New York City, he formed a partnership with his father-in-law, Ezra Daggett. As early as 1819 they canned oysters, lobsters, and salmon. In 1822 the firm was advertising in a New York newspaper, "meats, gravies and soups put up in tins, warranted to keep fresh for long periods, especially during protracted sea voyages."²²

In the next two decades canning became an established industry at various points on the Atlantic Coast, but especially in the neighborhood of Baltimore. Supplies of shellfish were superior in that area, and workers were easily obtained for the canning season. These advantages, together with Baltimore's facilities for distribution, made the city America's canning center.

About 1840 the canning of corn was begun in Maine, largely as a result of the persistent experiments of an old sea captain, Isaac Winslow; and gradually other vegetables as well were canned. To the original purpose of preserving food for long voyages was now added the prevention of waste of surplus fruits and vegetables. The California gold rush gave impetus to the canning industry: tinned meats and fruits were used extensively in the boom towns. In the Middle West the first cannery of which we have record was set up in Cincinnati in 1860. In the following year the Van Camp Company, now famous in this field, started operations in Indianapolis.²³ But it is conservative to say that prior to 1860 this method of preserving food was still largely confined to sea food and most of the canneries were located along the Atlantic Coast.

By 1860 tin cans crudely made by hand were in general use; machine-made cans were not developed until 1885. Tinsmiths (cappers) sealed

²² Clark, *History of Manufactures in the United States*, Vol. I, p. 485.

²³ The Van Camp Company at the start packed fruits and vegetables in five-gallon tins. The grocers opened them, retailed the contents and sent the cans back for refilling. William V. Cruess, *Commercial Fruit and Vegetable Products*, Chapter 3. New York: McGraw-Hill Book Company, 1924.

the cans after they were filled by hand. The cans were both expensive and undependable. Boiling water was used to sterilize the product; the process was slow; the canneries small (the largest processed only 2,000 to 3,000 cans a day); and the market limited. Prices of canned goods were high: a small can of tomatoes, corn, or peas, might sell for 50 cents at retail.

The decade 1850-1860 witnessed the beginning of fruit canning in California and of salmon canning in the Pacific Northwest. But the most striking development was the invention by Gail Borden of a successful method of canning milk. Borden was a lovable and romantic figure, in some ways the typical Yankee inventor. Born in 1801 of Puritan ancestry, brought up on the frontier of Indiana Territory, he spent much of his life in the South as schoolteacher, surveyor, newspaper editor, and collector of customs at Galveston. As a pioneer who felt the need of concentrated food for long marches in the wilderness, he invented a "meat biscuit" that he manufactured in large quantities for the men who joined the California gold rush. A trip across the Atlantic impressed him with the sufferings of immigrant children for lack of fresh milk, and set him to experimenting with the preservation of milk. Others, including Appert, had attempted to find a process before him. Borden's experiments were carried on in the dairy region of New York. In 1853 he applied for a patent "on a process of evaporating milk in a vacuum." The patent was held up for three years until the Patent Office was satisfied that the vacuum performed a really important function in protecting the milk from air and in keeping it clean while it was being condensed.

There are no census figures on the canning industry before 1870, but estimates put the total output before 1860 at about 5,000,000 cans a year. Ten years later it had risen to 30,000,000 cans. The War Between the States had undoubtedly brought a great impetus to the industry. The Union Army purchased large quantities of canned foods, of which thousands of men got their first taste in the army. Gail Borden's condensed milk became popular. Oysters attained a prominent place on menus inland as well as on the coast. Growing popularity and widening demand for canned food thus laid the foundation for future advance.

Beginnings of the Liquor Industry

European travelers who visited America at the end of the Revolutionary period were wont to make unfavorable comments on the poor quality of American tea and coffee and the excessive fondness of the country people for intoxicating liquors.²⁴ In Colonial times the health-

²⁴ See, for example, André Michaux, *Travels to the Westward of the Allegheny Mountains* (1805), R. G. Thwaites, ed. Cleveland: Arthur H. Clark Company, 1917.

fulness of alcoholic beverages was universally believed, in part no doubt because of painful experiences resulting from drinking impure water. The brewing of beer was carried on both in the home and in specialized plants. Many a pioneer family made its own supply, but in the larger towns breweries were soon established in which beer and ale were brewed for local consumption, as well as "strong porter" for ships' use and for export. Such plants were usually small in scale according to present-day standards: "Some country breweries represented an investment of less than \$1,000, and what were accounted considerable establishments sold for twice or three times that sum."²⁵ Breweries usually had their own malt houses, although often malting was a separate industry. Barley, wheat, Indian corn, and rice were all used as raw materials.

With the growth of the West Indian trade, rum made from West Indian molasses became a popular liquor. Its consumption increased in the eighteenth century at the expense of beer and cider. It was a prime article of trade with the Indians and an essential provision for the fishing fleet and the slave trade. The manufacture of rum was concentrated in Massachusetts, Connecticut, and Rhode Island. Rum was the poor man's drink; the well-to-do preferred their imported wines.

The Scotch and Irish immigrants of the eighteenth century brought a taste for whiskey, and after the Revolution it began to displace rum in public favor. Made from corn or rye "as commonly as grain was ground," whiskey became the drink of farmers as rum was the liquor preferred by mariners and the people of the seacoast. As the farming population spread westward grain distilling moved west just as had flour milling. In the undeveloped state of Western transportation before the canal and railroad era, the transportation of grain to Eastern markets was impracticable. Concentrated in the form of whiskey, it could stand high-cost transportation. At first whiskey distillation was most prominent in the western valleys of Pennsylvania, Maryland, and Virginia. After 1810 Ohio became the chief seat and Cincinnati "the largest whiskey market in the world."²⁶

About that time an effort was made to promote the sale of malt liquors in order to check the excessive consumption of rum and whiskey. Intemperance was beginning to cause alarm to thoughtful people, though it was still regarded with a degree of tolerance that seems strange to many persons today. This campaign was successful in part; but it was not until 1860 that the manufacture of fermented liquors exceeded that of

²⁵ Clark, *History of Manufactures in the United States*, Vol. I, p. 167.

²⁶ Clark, *History of Manufactures in the United States*, Vol. I, pp. 318, 480. See also Lyman Carrier, *Beginnings of Agriculture in America*, Chapter XXIV, for some interesting sidelights on the Colonial liquor industry. New York: McGraw-Hill Book Company, 1923.

spirituous. Meantime, however, the influence of German immigration had caused a switch from English ale and porter to lager beer.

Tobacco Manufacturing

The rise of tobacco culture in Colonial Virginia and Maryland, and its effect upon the economic development of those Colonies is an oft-repeated story. Contrary to the general belief, however, tobacco growing was not confined to those Colonies. Like corn, tobacco could be grown with some success on new land only partly cleared. Sometimes it was planted as a preliminary crop to grain for it was supposed to "mellow the soil." Consequently, tobacco planting was tried in New England, New Netherlands, and New Sweden before 1650. With the westward spread of settlement, tobacco growing obtained a foothold in the Connecticut Valley, in central New York and southeastern Ohio.²⁷ In the North, tobacco growing was usually associated with dairying, the livestock supplying the necessary fertilizer.

Virginia, the original home of tobacco culture in this country, continued to be the chief producing area until after the Revolution. From that state cultivation spread into the Carolinas, Kentucky, Tennessee, and Georgia, the largest producers at the present time. Though in Colonial times the product was grown primarily for the export market, domestic consumption was large. Much tobacco was used in the form of snuff, so that Colonial tobacco shops were called "snuff houses." Pipe-smoking absorbed much of the tobacco, but cigars were common and cheap, the retail price in the early days of the Republic being two for a cent or even less. Cigarettes were not commonly used until after the War Between the States; but tobacco-chewing was even more prevalent before the war than in later times.

The simplest and crudest processing involved leaf stemming, pressing the tobacco into plugs for those who chewed, grinding to produce snuff, and shredding to make fine-cut smoking tobacco. Once the household stage was passed, these operations were carried on in small shops except for snuff making, which required mechanical power. The preparation of chewing and pipe tobacco stayed close to the tobacco-growing areas, but snuff and cigar making were widely scattered. About 1812 New Orleans was prominent as a center of cigar manufacture. Fifteen years later some of the seaport towns in Massachusetts took an important place in the trade, making cigars for export to the West Indies. In 1846, when tariff duties on imported cigars were lowered, American manufacturers began to feel the effects of Cuban competition, and domestic consumers learned to prefer the Cuban tobacco in cigars. Amer-

²⁷ Bidwell and Falconer, *History of Agriculture in the Northern United States*, p. 15.

ican cigar makers met this situation by making cigars with Cuban tobacco filler and a domestic-grown wrapper. Most of the wrapper tobacco was grown in the North, particularly in Connecticut, hence the larger part of the cigar industry was kept in the Northern states. By 1860 Philadelphia was probably the leading cigar-making city.

The rest of the tobacco industry was more largely concentrated in the South. In 1840 Richmond was said to carry on 41 per cent of all tobacco processing, much of the work being done by Negro slaves hired from their owners to work in the factories. By 1860 40 tobacco houses in Richmond employed 2,500 slaves. At the same time Louisville and St. Louis were becoming important centers of manufacture, aided by the westward spread of tobacco growing in Kentucky and Tennessee.²⁸

The Dairy Industries

Today preparation of milk for delivery to consumers and manufacture of butter and cheese are factory industries, but in Colonial times they were household industries, for butter and cheese were made on all farms for home consumption. As much greater skill is required to turn out a good product than the average farmer possessed, the quality was apt to be poor.²⁹ Since there were no refrigerators, the butter had to be heavily salted. When there was a surplus above family needs, however, it could be sold at the general store. A cool springhouse and extra care sometimes produced superior butter that could be sold to selected customers at prices higher than the general store offered, and dairying might then become a business of producing for the market. By 1750 many farmers in Connecticut and Rhode Island were producing considerable quantities of both butter and cheese, some of which was exported.

After 1800 the farmers of New York State, particularly those of Orange and Ulster Counties, began to build up a reputation for high-grade butter and cheese. With the opening of the Erie Canal dairying on a large scale arose in the Mohawk Valley. By 1835 large quantities of butter and cheese were being shipped to Eastern markets, by way of the Erie Canal, from central and western New York and from the Western Reserve in northern Ohio. Before the War Between the States, the Western Reserve had acquired the name of "Cheesedom." The census of 1860 showed that New York was producing 46 per cent of all cheese manufactured in the United States, and Ohio 20 per cent. Butter production was less concentrated, but New York, Pennsylvania, and Ohio together produced almost half the American output.³⁰

²⁸ Clark, *History of Manufactures in the United States*, Vol. I, pp. 486-488.

²⁹ As late as 1843 a Richmond newspaper declared that much of the butter brought to that city would "hardly be thought good enough to grease a cart-wheel." L. C. Gray and E. K. Thompson, *History of Agriculture in the Southern United States*, Vol. II, p. 838. New York: Peter Smith, 1942.

³⁰ For an account of butter and cheese making before 1850 see Bidwell and Falconer, *History of Agriculture in the Northern United States*, pp. 424-430.

By that time the growth of cities had created a considerable market for fresh milk. At first, this was supplied by near-by dairies that could make direct deliveries. As transportation systems developed, the cities were enabled to draw their milk from more distant areas, and the "milk shed" of New York and those of other states covered a considerable area. Middlemen took over distribution.

About 1850 the first attempts were made to establish the factory system of cheese making. These earliest factories were located in western New York. Jesse Williams, a farmer in Oneida County who had had unusual success with his own dairy, undertook to supervise cheese making on neighboring farms. To simplify supervision, milk was delivered from the other farms to his dairy. The success of the plan, known as the "associated dairy system," doubtless led to the establishment of the first cheese factories. From New York State they spread into Ohio, Indiana, and Illinois, and thence into Wisconsin and Minnesota. Progress was slow, however; in 1860 there were only 17 cheese factories in New York State. The big developments in this field, together with the rise of the creamery and other plants using milk and cream as raw materials, came after the War Between the States. The milk condensory has a long history, but milk-powder plants, ice cream factories and chocolate factories are comparatively recent developments.

Conclusion

This brief survey has covered only seven industries. Many of the food-processing industries that are so important today, such as, for example, the cereal-breakfast-food industry, powdered-milk plants, and ice cream factories, did not exist a hundred years ago. Not all that did exist have been taken up in this chapter. Nevertheless, certain influences that guided the development of agricultural processing industries can clearly be discerned. For one thing, it should be noted that the spread and growth of these industries are closely linked to the growth of agriculture, from which they stem. Agricultural changes necessarily bring changes in the agricultural processing industries. A shift from tobacco growing to wheat growing helped to build up Richmond as a milling center. A new and superior type of wheat grown successfully in the territory tributary to St. Louis helped to make that city a milling center. The westward progress of hog raising developed new packing centers in the West.

Other factors helped to determine the final result. New markets in foreign lands may build up an industry and establish new manufacturing centers. This was the case with the Baltimore flour mills as a result of the development of Brazilian markets. Conversely, the closing of markets may ruin an industry, which is what happened when the War Between the States shut off Richmond's flour trade. New techniques of production have their influence on the spread of an industry, as was

the case after the introduction of Oliver Evans' flour-milling inventions. Favorable transportation may help to build up an industry in one locality and help to destroy it in another. And the business ability (or lack of it) of the enterprisers who organize the market for an industry's product and set up controls for its supplies of raw materials may play a large part in causing the growth or decline of an industry in a given locality.

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CHAPTER 11

Heavy Industries Before 1860

THE HEAVY INDUSTRIES IN THIS COUNTRY, as in Europe, are largely a development of the past century. Their growth has been consequent to the introduction and spread of the techniques and organization of production associated especially with the Industrial Revolution and stemming particularly from the indirect method of manufacturing that steadily replaced the older face-to-face relation between fabricator and consumer. So long as manufacturing was organized on the basis of fireside industries, handicrafts, small shops, and local markets, the term "heavy" could hardly be applied either to the capital investment, to the products of manufacture, or, with a few exceptions, to the equipment used. Even in certain mill industries the often massive equipment of mill wheels, gearing, and so forth, incidental to the use of water power was customarily constructed on the spot by local craftsmen and gave rise to no specialized branch of heavy industry. With the introduction and spread of steam power, machine production, and the factory system, all this was changed. The emphasis on mass production on an ever-expanding scale called for larger and stronger equipment, higher speeds of operation, and more massive power plants not only in the fabrication but also in the handling and transportation of materials, raw, semifinished, and finished. To handle things in large volume was to handle them more efficiently and cheaply, and the whole scale of industrial equipment moved upward. A new group of industries arose to supply and equip, not consumers, in the ultimate sense, but producers, with goods ranging from raw materials at one end to intricate machinery at the other. Ores and coal, the major nonferrous metals, iron and steel manufactures in their primary forms, the rails and rolling stock of railroads, and the more massive forms of industrial machinery and equipment, including that of the heavy industries themselves—all these are properly described as products of heavy industry.

The Iron Industry in an Agrarian Economy

The basic heavy industry of the new industrial age was, of course, the manufacture of iron and steel.¹ Even as organized and conducted in

¹ The principal older work in this field, J. M. Swank, *The History of the Manufacture of Iron in All Ages* (2nd ed. Philadelphia: The American Iron & Steel Association, 1892), has many limitations for the present-day student. The best

the pre-industrial era iron manufacturing, puny as its scale of operations appears in comparison with modern standards, may quite properly be described as a heavy industry, both with respect to the size of the equipment used and as to the weight of the masses manipulated during the processes of manufacture. The blast furnaces of the eighteenth century with their equipment of waterwheel and bellows or blowing cylinders were much the largest industrial mechanisms to be found in the country at the time. The iron industry was not only to provide basic materials for the new heavy industries but in scale of operations and size of equipment to set their pace as well.

At the opening of the nineteenth century the great bulk of the iron manufactured in this country was produced by the two-stage process of smelting and refining.² The quantity of iron made directly from ore in bloomery forges was not large and its production was confined increasingly to a limited section of the country. The iron ore was reduced by smelting in the blast furnace, with charcoal as fuel, and except for hollow ware, that is, kettles, cooking utensils, and other articles made by casting directly from the furnace, the product was crude cast iron in the heavy lumps known as "pigs." While some pig iron was remelted in the air furnaces or cupolas of foundries for recasting into various articles, the greater part of the product of the blast furnace was subjected to a second reduction or refining process in an open forge. In this process various impurities contained in the iron were in greater or less degree eliminated and the amount of carbon was reduced. At the same time the crystalline structure of pig iron gave way to a fibrous, striated structure of near-pure iron intermingled with slag that possessed the essential qualities of malleability and capacity for welding. The refining process consisted of repeated heatings in a forge and beatings under a water-driven trip hammer, which, with its head of several hundredweight, was the principal mechanical equipment. The resulting product was drawn out under the trip hammer into wrought-iron bars of various sizes in current demand. Iron plates were of distinctly secondary importance, owing to the smaller demand for them and to the difficulty and expense of hammering them out.

Almost invariably the ironmaster depended upon local sources of ore and fuel, owning or leasing the land on which they were found or contracting for supplies. Ore, with few exceptions, was obtained from surface or near-surface deposits through excavation, open drifts, or stripping. Charcoal was prepared in the traditional manner from cordwood

general source for the study of heavy industry, including iron and steel, in this period is V. S. Clark, *The History of Manufactures in the United States* (1929 ed.), Vol. I (1607-1860).

² The best detailed description of the old rural iron industry is found in A. C. Bining, *The Pennsylvania Iron Manufacture in the Eighteenth Century*. Harrisburg: Publications of the Pennsylvania Historical Commission, 1938.

The huge quantities of this fuel required—between 175 and 250 bushels per ton were used in the smelting process alone—necessitated access to cheap and abundant timber. Poor roads, limiting the radius within which ore and fuel could be obtained, served as a check on the scale of operations and periodically forced the abandonment of old furnace stacks as accessible raw materials were exhausted.

The production of the typical blast furnace did not exceed several tons a day during an annual season often of no more than 20 to 30 weeks. The rest of the year was spent in gathering and preparing stocks and in idleness enforced by a lack of water power during the driest and coldest portions of the year as well as by a labor scarcity caused by the pressure of agricultural needs. The pre-industrial character of the iron manufacture conducted in this manner is suggested not only by its small scale of operations and rural environs but by the nature of its market and the uses to which its products were put. Production was geared primarily to the needs and requirements of an essentially agricultural economy. The local market served by most iron works was a rural one and the products made were largely those indispensable to the farm. The principal cast-iron wares were articles in demand in the typical rural household—pots, skillets, and other utensils for cooking; kettles for making soap, rendering lard, and washing; heavy pans for boiling down syrup, andirons, sadirons, and various other articles in the same class. The bar iron of assorted sizes that was the leading product of the refinery forges was also made to meet the requirements of a predominantly agricultural population. Known as merchant bar, it was regularly stocked in innumerable country stores for blacksmiths, the principal iron fabricators of the time. The sizes of bar iron in greatest demand were those most suitable for making into wagon tires, horseshoes, chains, nails, and a wide variety of tools, implements, and other articles in use about the farm and home that the blacksmith—and frequently the farmer with his Jack-of-all-trades ingenuity—ordinarily made and repaired at his forge.

In many ways the typical blast furnace and forge of the eighteenth and early nineteenth century more closely resembled the local mill industries that loomed so large in the agricultural economy of the period than the factory system in which it occupied so prominent a place at a later day. Drawing its supplies from and often disposing of its products in the immediate vicinity, it devoted its operations to the needs of the rural communities that it served. The early ironworks, however, stood apart in important respects from the fulling and carding mills, the gristmills and sawmills, early established in every frontier area. The operations performed at such works were at no time conducted, as was the grinding of grain, sawing of wood, and so forth, by the individual farmer. Even had iron ore been readily available, the high degree of skill

and elaborate equipment required would have made individual production impractical. Moreover, the ironworks, with its extensive ore and timber properties and heavy equipment, represented a far greater investment of capital than other types of mill industry. Whereas the typical gristmill or sawmill was owned and operated on a one-man (family) basis, the rural ironworks, which even in the eighteenth century called for an investment of thousands of pounds sterling, was conducted by a partnership. Although the ironmaster was usually the principal owner, capital was put up by merchants, professional men, planters, well-to-do farmers, and many others with funds to invest.

In the first stage of its development, the iron manufacture was distributed throughout the country, as the result of the widespread availability of ores in workable amounts and the active if limited demand for iron in the settled regions. Iron was made in all but one of the Colonies, and prior to 1860 ironworks were in production for a time at least in every state east of the Mississippi, except for three in the Deep South, as well as in several states of the trans-Mississippi West. The greatest concentration of the industry prior to 1800 centered in Pennsylvania, Maryland, New Jersey, and eastern Massachusetts. This range of activities had not changed greatly by 1860, save for the development of important Western areas of production, especially in the Ohio and Cumberland Valleys. Works conveniently situated near transportation facilities disposed of a portion of their products outside of their immediate localities.

Revolution in the Iron Industry

The story of what might be called the industrialization of iron manufacture and its transformation into the basic heavy industry is one in which a number of major changes occur: the introduction of the newer techniques of making iron; the concentration of the industry in large urban centers; the shift from wood to coal as fuel and from local to assembled supplies of ore and crude iron; and, of particular importance, the steady replacement of an essentially agricultural demand for iron by one stemming from the advance of industrialization in all branches of American manufacture.

The technical innovations of the period from the close of the eighteenth century to the decade ending in 1860 followed in reverse order those established by the revolution in iron manufacturing in England: rolling, puddling, and the replacement of charcoal by mineral coal as fuel in the several processes. Whereas in England the original impulse to change was given by scarcity of timber, in this country the primary factor was scarcity of labor; the first of the new processes to be adopted was rolling, and the last the use of coal in the blast furnace. The method of reducing slabs or blooms of iron to bar iron by means of grooved rolls

in place of trip hammers was first introduced in this country at a rural ironworks in western Pennsylvania in 1817 and was quickly taken up by the rising iron industry at Pittsburgh and at other centers of iron manufacture. The adoption of the refining process of puddling was not slow to follow. Puddling differed from the traditional method of refining pig iron in the open forge not so much in the essential character of the refining process (which was little changed) as in the scale of operations and the equipment used. The open forge, in which the pig iron was heated and worked in direct contact with the fuel, was replaced by the closed furnace of the reverberatory type, in which the metal was worked by hand tools on a hearth out of contact with the fuel, which burned in a separate firebox. The reverberatory furnace not only permitted the working of larger charges of metal more rapidly and with less consumption of fuel, but, by separating fuel from metal, made possible the substitution of mineral coal for charcoal, heretofore impractical because of the harmful effect on the finished product of the sulphur and phosphorus present in coal. The advantage of coal lay not only in its lower cost (despite the abundance of timber in this country), but in its concentrated character. It was pointed out about 1850 that, whereas from 2,000 to 5,000 acres of timber were required to supply an ordinary charcoal furnace, a coal mine with a 6-foot seam, covering half an acre, would yield a sufficient supply. The centralization of the iron industry was made possible by coal.

With the introduction of rolling and puddling, primary iron manufactures lost their once wholly rural character, and the industry was gradually reorganized on the basis of rural blast furnaces smelting iron with charcoal, and urban rolling mills refining and reducing pig iron by the newer techniques, in most cases with mineral coal as fuel. The course of centralization is well illustrated by its development in Pittsburgh.³ The first iron manufacturers there were blacksmiths who fashioned wrought bar from the rural ironworks of central Pennsylvania into finished articles to supply demands arising from commercial activity centering at this strategic point of transfer between the transmontane routes of travel and the Western river system. From this initial stage, Pittsburgh's iron industry took over successive steps in the making of iron from the rural sources of supply until finally all processes, beginning with smelting, were conducted in the city. Hammered bar was early replaced by slab iron or blooms as the raw material of the industry, and, with the improvement and spread of the puddling process, blooms in turn were displaced by pig iron. As the scale of their operations

³ The economics and technology of centralization at Pittsburgh are described in Louis C. Hunter, "Influence of the Market upon Technique in the Iron Industry of Western Pennsylvania up to 1860," in *Journal of Economic and Business History*, Vol. I, pp. 241-281.

expanded, Pittsburgh's rolling mills drew pig metal from a steadily widening radius of territory. Depending at first chiefly on crude iron brought by wagon and flatboat from central and western Pennsylvania, by 1840 Pittsburgh manufacturers were using pig iron carried by steamboat and canal as well as by flatboat from blast-furnace districts as widely separated as western Tennessee and eastern Pennsylvania, with western Pennsylvania, Ohio, and Kentucky supplying the bulk of the needs.

Alongside Pittsburgh must be placed the other rolling-mill centers of the country in the years preceding the War Between the States: Cincinnati, St. Louis, and Wheeling in the West; Philadelphia, Scranton, and Phoenixville in eastern Pennsylvania; Boston; the Troy-Albany district; and, in the South, Baltimore and Richmond.⁴ Single plants of outstanding size were occasionally found in smaller places, such as the Cambria plant at Johnstown and the Great Western works at Brady's Bend, western Pennsylvania. More than half the rolled iron in the country in 1856 was made in Pennsylvania.

The final stage in the centralization of the iron manufacture, the establishment of blast furnaces at the rolling-mill centers of the country, was dependent on two factors: the adaptation of mineral coal as a smelting fuel and access to ample ore supplies. The substantial beginnings of this stage date from the forties and fifties, but it was not until the decades following the surrender at Appomattox that the transition gained momentum. The shift from charcoal as a blast-furnace fuel got under way first in the iron region of eastern Pennsylvania during the thirties, stimulated by the growing scarcity of charcoal and the availability of anthracite coal, and was made technically practical through the use of the hot blast. By 1860 nearly 100 blast furnaces in eastern Pennsylvania used anthracite coal as fuel and in the country as a whole the output of anthracite iron had passed that of the traditional charcoal iron. The introduction of bituminous coal proceeded more slowly in the trans-Appalachian region. The delay in its adoption was not due simply to the abundance of timber (contrary to the accepted view, cheap timber did not make cheap charcoal), nor to prejudice of consumers and producers but, above all, to the fact that wrought iron made from coal or coke pig iron was not so well adapted to the agricultural uses to which iron was put in the West as the charcoal-smelted product. For general blacksmithing purposes, the toughness, malleability and capacity for welding of charcoal-smelted iron made it much preferred to that made from coal or coke pig iron. The latter product first found general acceptance in rolling mills engaged in the manufac-

⁴The Virginia iron industry centering at Richmond is admirably handled in Kathleen Bruce, *Virginia Iron Manufacture in the Slave Era*. Published for the American Historical Association. New York: D. Appleton-Century Company, 1931.

ture of rails. By 1860 bituminous coal and coke were well established as blast furnace fuels in the major pig-iron districts of the West.

The successful introduction of coal in blast-furnace practice removed a major obstacle to the scale of operation heretofore imposed by both technical and transportation difficulties connected with the use of charcoal. Typical weekly yields of 25 to 30 tons of iron from the old-style charcoal blast furnaces were before 1860 dwarfed by yields of as high as 300 tons from the much larger furnaces developed to make use of mineral coal. With greatly enlarged furnace capacity and the trend toward centralization of pig-iron production in rolling-mill centers, the problem of supply of raw material shifted from fuel to ore. The widely distributed surface deposits of ore, which served the rural pig iron industry, were quite inadequate to the great and expanding needs of the coal and coke blast furnaces. At first the enlarged blast-furnace plants were located near the more extensive ore deposits of the older iron districts but an industry capable of meeting the needs of a nation in process of industrialization could not attain permanency until the great ore ranges of the Lake Superior country were discovered and made accessible. Not only was the ore of the five great ranges from Marquette to Mesabi present in masses of near-mountain proportions, some of which were admirably adapted to exploitation by open-cut and stripping methods, but its metallic content was much above that of the ores of the older iron districts, often half to twice again as large.

The problem of transporting the ore to the important iron districts of eastern Ohio and western Pennsylvania some 600 to 1,000 miles away was solved by the development of specialized ore steamships and extraordinarily efficient ore-handling equipment at loading and unloading docks on the Great Lakes and by the construction of ore-carrying railroads to and from the lake ports. Not until the completion of the original Soo Canal in 1855 did the development of the Superior ores get under way. By 1860 nearly one-tenth, 10 years later fully one-fourth of the pig iron manufactured in the United States was made from Lake Superior ore. The center of iron production, which had long rested in eastern Pennsylvania, moved gradually to the trans-Appalachian region. Pittsburgh with inexhaustible supplies of unsurpassed coking coal at its doorsteps prepared to assume the dominant position in the nation's iron industry. The erection of its first blast furnace in 1857, using coke fuel and ore drawn by water and rail from the distant ore fields of Missouri and Lake Superior, marked the beginning of a new era in the iron manufacturing not only of this region but of the entire country.

Associated with the changes in technique of production were changes in the use of and demand for iron.⁵ Blacksmith's bar and nail iron

⁵ This matter is discussed in some detail in the Hunter article cited above.

receded steadily in importance before iron in the variety of forms and shapes required for industrial purposes, above all those growing out of the introduction of steam power in transportation. By 1850 if not earlier the railroad had become the leading industrial outlet for iron and within 10 years after the War Between the States one-half of the iron consumed in the United States was employed in railroad construction and maintenance. The manufacture of rails for the rapidly expanding railway network of the country led to a virtual revolution in blast-furnace and rolling-mill practice. Early rails were merely heavy strap iron, differing only in size from the ordinary run of merchant bar turned out by the typical rolling mill. As the demand for rails assumed vast proportions and strap rails gave way to rails with U- or T-shapes, specialized rail mills on a large scale were established to meet the demand. The rolling of shaped rails called for new and specialized rolling equipment and enlarged power plants as well as iron of a quality better adapted to the manufacture of rails and more economical than that suited to merchant bar. Some of the largest rail mills operated their own blast-furnace plants to supply them with crude metal. The first rail mills were erected in the middle forties and 10 years later a full score were in operation, of which the largest were located in Pennsylvania where two-thirds of the total product in the country was rolled prior to 1860. West and south of Maryland the rail mills were small in number and capacity and were engaged chiefly in rerolling worn rails. In 1860 the annual output of these mills totaled 235,107 tons, absorbing close to one-fourth of the pig iron of the country and surpassing bar iron in importance. Outstanding among the rolling mills of the fifties were the Phoenix Rolling Mills in eastern and the Cambria Iron Works in western Pennsylvania. Of the 3 rolling mills comprising the Phoenix plant, the rail mill with its 36 heating and puddling furnaces and 3 trains of rolls quite overshadowed the other 2 works, turning out 18,592 tons of rails in 1856. The Cambria Works at Johnstown, Pennsylvania, was the largest integrated rail mill in the country. Its 30 puddling furnaces were supplied with pig metal by 1 charcoal and 6 coke furnaces, and from its 4 trains of rolls in 1857 came 17,808 tons of rails.⁶ The first wrought-iron girders were rolled in the decade before the War Between the States, but the age of structural iron was still in the future.

Heavy Machinery: Steam Engines

Prior to the new age of iron, heavy industrial equipment was made largely of wood, owing to the difficulty of shaping and working iron. In mills in which water power was employed for grinding flour, operating

⁶ An interesting cross-section view of the iron industry in all its branches in this year is given in John Peter Lesley, *The Iron Manufacturer's Guide*. New York: John Wiley & Sons, 1859.

trip hammers, and providing air blast, the ponderous wheels, shafts, and gearing were made entirely of wood except for such iron as was used for fastenings and at points of bearing. The trip hammers themselves were made largely of wood, as were the blowing tubes for making the blast and even the cylinders and boilers of the first clumsy steam engines. Alongside the blast furnaces and rolling mills of the industrial era now arose works for the production of heavy machinery and other industrial equipment. Employing pig-iron and wrought-iron bars and slabs as their chief raw materials, the products of these heavy industries were given their rough form in foundry and forge shop and were finished to exact dimension and fitted in the machine shop. Blowing engines for blast furnaces, machinery for rolling mills, mills for crushing sugar cane, heavy shafts, car wheels and axles, gears, flywheels, and a variety of other mill machinery and equipment were turned out by these works, but their most important products were steam engines—stationary, marine, and steamboat—and locomotives.

The development of steam engines merits special mention. Amounting to only a handful in this country before 1800, the beginning of their commercial production may be said to date from the establishment of the works of Oliver Evans in Philadelphia about 1805 and in Pittsburgh a few years later. Evans has received increasing recognition as one of the great mechanics and engineers of our industrial infancy. In the years immediately following the War for Independence, he devised a system of continuous flour milling that completely mechanized the process and effected a radical change in the conduct of the industry. Thereafter his attention was directed chiefly to the improvement of steam power and its application to industrial purposes, especially transportation by water. The steam engine as improved by Watt and manufactured by Boulton and Watt used steam of low pressure; it was a heavy and complicated mechanism, costly to build and difficult to maintain and keep in repair. Spurred on by the need for a power plant of light weight suitable for driving boats, Evans built a high-pressure steam engine which in proportion to its weight was many times as powerful as the prevailing low-pressure type. By perfecting a simple, powerful, and cheap engine, Evans popularized the use of steam power in this country for manufacturing and transport purposes alike.⁷ Navigation was the most important of the early uses to which steam power was put. What the railroad was to the iron industry after 1850, the steamboat had been in large measure during the preceding generation. Despite the almost universal use of wooden hulls, the hundreds of steamboats launched each decade from the shipyards along the Atlantic Seaboard and the

⁷ For an outstanding work in its class, see Greville and Dorothy Bathe, *Oliver Evans: A Chronicle of Early American Engineering*. Philadelphia: Historical Society of Pennsylvania, 1935.

Western rivers absorbed great quantities of iron in their construction. The production of engines with cylinders ranging up to 9 feet in diameter, batteries of as many as 8 boilers 30 feet and more in length, smokestacks that often towered 75 feet above the main deck, hog chains, tie rods, walking beams, chain cables, gallows frames, anchors, steam and water pipes kept foundries and forge shops, the boiler works and machine shops humming in the steamboat building centers of the country. On the Western rivers alone more than 3,500 steamboats were built prior to the War Between the States. A Treasury Department survey in 1838 showed that even at this advanced date steamboat engines accounted for nearly three-fifths of the total steam power of the nation, possessing an average power rating three and one-half times as great as that of engines used in industries and by railroads. Iron rolling was the only branch of industry using engines of comparable power.⁸

The building of locomotives in this country dates from the beginning of the railroad period; comparatively few were imported from England.⁹ The first locomotives were built in general foundry and machine-shop works but specialized locomotive works were soon established, among them the well-known firms of Baldwin (1832) and Norris (1834) in Philadelphia, leading center of the industry. So successful were American locomotive builders that their products were being exported to Europe in substantial numbers even before 1840. The Norris firm sold 41 of its first 145 locomotives in Europe, and another American company built 162 locomotives for a Russian railroad. The early locomotives were small affairs, weighing frequently but from 5 to 10 tons and using much wood in their construction; by the middle of the century locomotives of from 20 to 25 tons were common. According to the census of 1860, 19 establishments were engaged chiefly or wholly in the manufacture of locomotives, employing a capital of nearly \$500,000 and 4,174 hands. The three largest concerns, located in Philadelphia and Paterson, New Jersey, built 258 of a total output of some 470 locomotives for the entire country.

Foundry and Forge

Foremost in the equipment of the plant making steam engines and other heavy machinery was the foundry, where were made those parts which because of their size or peculiarities of shape could not be produced under the forge hammer. Such parts as engine cylinders were always cast; other parts such as boiler heads, shafts, girders, pillars and other

⁸ This "Report on the Steam Engines in the United States" (House Ex. Doc. 21, 25th Congress, 3rd session) is one of the most interesting documents of our early industrial history.

⁹ Much the best work available on the evolution of the American locomotive is Angus Sinclair's *The Development of the Locomotive*. New York: A. Sinclair Publishing Company, 1907.

supporting members were early made of cast iron and later forged from wrought iron. With the machines available in the early years, the forging of heavy shafts, connecting rods, and the like was often impractical and the products of forging with inadequate equipment were frequently imperfect, breaking under strain. Recourse was sometimes had to wood as in the case of paddle wheel shafts, pitmans, and flywheel arms in steamboats and of spokes and felloes in locomotive driving wheels; but when iron was necessary or desirable, castings were long used. Every foundry had one or more cupola furnaces, similar to blast furnaces in construction and operation, in which the pig metal was melted down for casting. A wooden facsimile of the part or piece desired was carefully constructed by the pattern-maker as a model for making molds of damp sand, into which molten metal from the cupola was poured. Upon cooling, the casting was given the necessary finish by lathe, file, and chisel. In this manner there were made not only intricate shapes quite beyond the limited range of the trip hammer but simpler pieces such as shafts in which size and strength were the main feature. As late as 1828 castings weighing 4 tons aroused comment but within a few years others weighing 30 to 40 tons were being made and about 1850 a 60-ton bedplate for a steamship engine had been cast by a New York firm. On the other hand, a 6½-ton shaft made forging history in 1841 and 20 years later 23-ton shafts marked the peak of forging technique. Such work was exceptional, the regular forging of heavy pieces waiting upon the general introduction at forge shops of the steam hammer and of heating furnaces of large capacity. Prior to 1861, according to Clark, a 6½-ton Nasmyth steam hammer and a 7½-ton Condy hammer were the largest in use in the United States. The railroad gave rise to a specialized branch of foundry work for the manufacture of car wheels, running four or five in number to the ton in weight. The largest establishment of the kind in the United States in 1860 was a Wilmington foundry where 30,000 of a national total of 142,000 car wheels were made with a value of \$500,000.

The Early Copper Industry

Of the nonferrous metals, only copper and lead attained in the *antebellum* years a position deserving notice. As in the case of iron, the early history of copper is marked by the wide distribution of the industry. Copper has been mined at one time or another in nearly every Seaboard state from Maine to Alabama. The oldest mines in the country are the Simsbury (or Newgate) mines in Connecticut; the Ely mine in Vermont was at one time the largest producer of copper in the country. The record of the Eastern states in copper production is one of numerous small-scale mines opened, worked for a time, then abandoned, to be reopened in many instances years later, under favorable

market conditions, and again operated for a time. The failure or limited success attending most of these enterprises has been due to the relatively small extent of the deposits and the difficulty and expense of their extraction. Annual outputs even of the larger mines did not often exceed one or two thousand tons of ore. The most productive of the Eastern mines in the years before 1860 were those of the Ducktown district in the extreme southeastern portion of Tennessee, and extending across the line into Georgia. This development got under way in the fifties when a number of mines were opened and a "copper fever" ruled temporarily. First worked in 1852, the total output of the mines in this district to July, 1854, was something over 18,000 tons of ore, averaging 32 per cent copper.¹⁰

The Eastern copper deposits were reduced to a position of quite minor importance by the discovery and active exploitation in the middle forties of the rich resources of the Lake Superior copper deposits in northern Michigan. The presence of copper in the Superior country was known to missionaries and explorers as early as the seventeenth century but it was not until in 1841 that the rich possibilities of the district were made public by the report of Dr. Douglass Houghton, state geologist of Michigan. When the Government opened lands for location in 1843, speculators and their agents swarmed in and started a copper boom that reached its climax in 1846. Then a reaction set in, to be followed shortly by a soberer and a more substantial growth. By 1860, fully three-fourths of the 8,000 tons of copper in the United States came from the Michigan mines, which were concentrated in three districts. From the beginning, mining operations in the Superior fields were dominated by a few large companies. The heavy expenses of exploration and development, of sinking shafts hundreds of feet deep and opening levels often miles in length, together with the cost of the heavy machinery for raising and concentrating the ore, called for amounts of capital that only large organizations could supply. The capital investments of the larger companies ranged from \$100,000 to \$500,000 and up. The copper deposits were, however, extraordinarily rich, and with care in development, the best properties paid handsome returns. A distinctive feature of the Superior fields was the large amount of native copper present in many of the veins. Masses of solid copper weighing from several hundred pounds to several tons were common, and others

¹⁰ For the early history of the copper industry, consult J. W. Foster and J. D. Whitney, *Report on the Geology and Topography of a Portion of the Lake Superior District in the State of Michigan* (Washington, D. C.: Printed for the House of Representatives, 1850-1851); A. S. Piggot, *The Chemistry and Metallurgy of Copper* (Philadelphia: Lindsay and Blakiston, 1858); and W. H. Weed, *Copper Deposits of the Appalachian States* (Washington, D. C.: U. S. Government Printing Office, 1911). An interesting popular account of the Lake Superior copper industry is Angus Murdoch, *Boom Copper: The Story of the First U. S. Mining Boom* (New York: The Macmillan Company, 1943).

weighing 20 to 50 tons were not infrequent. In 1853 a mass of native copper measuring 40 by 20 by 2 feet, with an estimated weight of between 150 and 200 tons, was dislodged.

The first large-scale copper mining operations in the United States got under way in 1844 at the Cliff mine of the Pittsburgh and Boston Mining Company. By 1850, this mine employed 160 men and shipped 1,500,000 pounds of ore, yielding nearly half its weight in copper. On an original paid-in capital stock of \$111,000 dividends were first declared in 1849 and for the years 1849-1856, inclusive, reached a total of more than \$700,000. Equally extensive were the operations of the Minnesota Mine, which in 1855 employed 471 workers and produced 1,434 tons of copper.

Even in the larger developments, mining operations were at first conducted by near-primitive methods, with hand tools. The great masses of native copper frequently encountered could be removed only with great difficulty because of the meager equipment available. Such masses had first to be laboriously cut into pieces that could be moved by the tedious and expensive use of hand chisel and sledge hammer. In the early years clumsy horse-driven whims employing large wooden winding drums hoisted copper and ore from depths of as much as several hundred feet. Steam power was necessary, however, to operate the massive stamp mills in which the ore, after calcining in ovens or open heaps, was crushed before its separation from waste rock by washing. The early stamp mills consisted of vertical wooden beams or pestles with iron heads weighing 100 to 300 pounds that were raised and dropped by cams fixed in a revolving horizontal cylinder. Within a few years mills of this type were superseded at the larger mines by stamps built on the plan of a steam hammer with each stamp leg bearing a total weight of 2,500 pounds and making 90 to 100 strokes a minute.

With few exceptions smelting and refining operations were not conducted near the ore fields, owing in part to the early establishment of these branches of the copper industry in the leading Eastern seaports of Boston, New York, and Baltimore, where imported raw materials and cheap fuel were available and the manufacture of sheathing and fastenings for ships afforded a market for their product. As a consequence of the lack of cheap fuel in the mining districts, smelting and refining operations were relegated to the Eastern centers and to works later established at Pittsburgh and the lake ports of Cleveland and Detroit. At these points, too, were rolling mills for the reduction of the refined metal to the shapes in demand, chiefly sheet copper for sheathing, boilers, stills, pipes, and the like. Sacks of copper ore from a southern Appalachian mine were wagoned 40 miles to a railroad for shipment hundreds of miles north to smelting works. Lake Superior copper in the several forms of mass copper, barrel work (small lumps

of mass copper with associated rock), and stampwork was regularly shipped as far as Pittsburgh and Boston for further treatment. Smelting and refining operations were carried on for the most part in reverberatory furnaces similar in character to those in which iron was puddled. Charges of several hundredweight, together with flux and later additions of charcoal or wood, were reduced to a molten state in which the earthy gangue rose to the top in the form of slag and was removed. With minor differences in treatment this process was repeated several times until the sulphur, arsenic, iron, and other impurities found in copper were completely eliminated. The resulting ingot copper was reduced to the desired shape and size in the rolling mill. These crude methods of refining were tolerated chiefly because of the richness of the ore; there were heavy losses of copper in the slag, to recover which it was sometimes reduced in the cupola furnace. Although sheet copper was the most important product, increasing amounts were made into brass to supply the rapidly expanding industry centering in the Naugatuck Valley of Connecticut.¹¹

The Early Lead Industry

In the production of lead few of the characteristics of heavy industry were found, and its consideration here will be useful primarily by way of contrast with the matured industry of the later years.¹² In scale of operations, equipment, and capital investment lead manufacture cannot be classed with either the iron or copper industry although in total product it exceeded copper in importance. In the possession of lead as of copper, the United States was far from self-sufficient and the Eastern Seaboard obtained its supplies chiefly from abroad. Deposits of lead ore were found and occasionally worked in a number of Eastern and Southern states but in amounts that in most instances were of negligible importance. Prior to 1870 when the exploitation of the rich silver-bearing ores of Montana and Idaho was begun, lead production in this country centered mainly in two districts of the upper Mississippi Valley: the Potosi district of southeastern Missouri, and the Wisconsin district of southwestern Wisconsin and the neighboring sections of Iowa and Illinois. The Potosi district was the first developed. Mining of lead here dated from the early eighteenth century but production was not great, averaging an estimated 1,250 tons annually from 1801 to 1820. Though early known, the lead resources of the Wisconsin (or

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Galena) district were scarcely touched prior to 1820. Extensive exploitation began in the late twenties. Favored by ready access to cheap water transportation, lead shipments from this district increased from less than 100 tons in 1820 to 5,000 tons in 1828 and 17,000 tons in 1857, compared with an annual output of only 2,000 tons in the Potosi district between 1825 and 1855. The peak of lead production in these pioneer developments of the Mississippi Valley was reached by 1850. Thereafter a gradual decline set in, owing to the exhaustion of the best ores, the ever-increasing cost of mining at lower levels—especially the expense of pumping once the water-table was reached—and a reduction in the tariff on lead.

Mining and smelting were, with few exceptions, conducted on a small scale by individuals and small groups. Many of the mines were little more than surface diggings and shafts rarely exceeded 50 to 75 feet in depth. Veins of any great depth could not be exploited because of the expense involved; similarly the cost of cutting through nonproductive bodies prevented reaching much profitable ore. Only the higher grades of ore could bear the expense of development. The mines were worked irregularly and inefficiently. Pick and shovel, hand-drill and crowbar, candles, wheelbarrows, and blasting powder were the usual equipment. Ore was raised to the surface in heavy wooden buckets or tubs by two-man windlasses. Smelting was conducted on a level comparable to mining. A furnace devised by the Indians was often used in the early years. The ore was reduced in a trenchlike hillside excavation with wood as fuel, the molten lead collecting at the bottom of the slope to form pigs. The process was simple but very wasteful of metal. The log furnace, built of impermanent limestone and with greater capacity, was an improvement on the primitive Indian type, but it in turn was supplanted after 1840 by more efficient blast furnaces of the reverberatory and cupola types. By 1860 the handicraft stage in both mining and smelting belonged largely to the past, and the production of lead was beginning to take on the characteristics of a heavy industry.

From Wood to Coal

During the first quarter of the nineteenth century, the coal industry of the United States was only of minor importance.¹³ From the late eighteenth century coal was used for domestic purposes increasingly in

¹³ Despite widespread interest in the coal industry during the past generation and an extensive literature dealing with its problems and ailments, the industry still awaits its historian. Much useful material on the development of the anthracite industry is found in Eliot Jones, *The Anthracite Coal Combination in the United States* (Cambridge, Mass.: Harvard University Press, 1914). For statistical material on the early industry, see R. C. Taylor, *Statistics of Coal*, 2nd ed. (Philadelphia: J. W. Moore, 1855). A wealth of historical data on the coal industry is contained in Howard N. Eavenson, *The First Century and a Quarter of American Coal Industry* (Pittsburgh: privately printed, 1942).

the Seaboard cities, the Virginia mines being the chief source of supply. In the East men were slow to recognize the value of the rich anthracite deposits of northeastern Pennsylvania and active exploitation of the bituminous fields, long confined to a small district in western Pennsylvania, awaited settlement and industrial growth in the West. Difficulties of development and of transportation of coal combined with the abundance of cheap and easily accessible timber to make wood the basic fuel for domestic and industrial purposes until well into the nineteenth century. As late as 1850 railroads and steamboats as well as the metal industries used wood as their principal fuel but with the growth of urban centers exhaustion or scarcity of near-by supplies of wood made it increasingly difficult to rely on this source of fuel. Coal was adopted as more compact and economical. Manufacturers and home-owners alike turned more and more to its use as improvements in transportation facilities made it more accessible.

The Rise of Anthracite

Prior to 1850 there were two major centers of coal production in this country, both of them in Pennsylvania: the anthracite district of the northeastern part of the state and the bituminous district of the Pittsburgh-Connellsville area. More than 95 per cent of the rich anthracite resources of the country are concentrated in five Pennsylvania counties, the workable beds occupying some 480 square miles, divided among several fields. Although it was known well before the eighteenth century that coal was present in these fields, its development was retarded partly by the difficulties attending the use of this fuel but to a greater extent by its remoteness from the principal urban markets of the Seaboard. Some was floated down the rivers in flatboats at flood stages but the risks and difficulties involved slowed the growth of the trade. Businessmen who became interested in the exploitation of the anthracite fields, finding themselves first obliged to provide transportation facilities for carrying their product to market, undertook ambitious programs of canal building and river improvement. Between 1820 and 1830 a number of important canals were built, notably the Delaware and Hudson, the Lehigh, the Morris, and the Schuylkill.¹⁴ These canals were supplemented by short connecting railroads running to the mines. The significant consequence was that in two of the three major anthracite fields, mining properties and transportation facilities were in the same hands. Only in the Schuylkill district did the canal company leave the mining of the coal open to independent operators. The union of transportation and mining in the same companies led to various abuses,

¹⁴ The standard work on this subject is C. L. Jones, *The Economic History of the Anthracite-Tidewater Canals*. Philadelphia: University of Pennsylvania, 1908.

loud complaints, and eventually in 1833 to an investigation by a state commission. The recommendation of the commission that the mining and transportation of coal be separate enterprises was not acted upon. The next 40 years saw the gradual decline in the importance of the canal systems as dominant factors in the anthracite industry and their replacement by railroads. The progress of railroad construction, the purchase of coal lands, and the concentration of ownership by mergers and consolidations continued until by 1870 a handful of railroad corporations, headed by the Lackawanna, the Lehigh Valley, and the Philadelphia and Reading, owned the greater part of the anthracite district. These railroads bought up large areas of the coal regions, not only to assure traffic for themselves but to shut out new and competing lines. The combination of coal mining and transportation in the anthracite district greatly increased the normally high capital requirements of the industry and corporate enterprise dominated the field from the beginning.

The development of the industry, slow before 1840, proceeded rapidly thereafter, stimulated by the widening use of anthracite, especially in the manufacture of iron and in steamboat transportation. Shipments of coal from the anthracite region mounted from 376,000 tons in 1834 to about 1,000,000 tons in 1842 and 10,000,000 tons in 1864.

The Bituminous Industry

The existence of coal in western Pennsylvania was known prior to the War for Independence and mining privileges in Pittsburgh's Coal Hill were sold in 1784. From this time on, the exploitation of the rich bituminous coal resources underlying the region went hand in hand with Pittsburgh's industrial development, which from the beginning relied almost exclusively upon coal as a source both of heat and power. The great Pittsburgh seam that was long the chief source of coal in this region lay exposed on the hillside for miles along the Allegheny, Monongahela, and Ohio Rivers. Its thickness of 6 to 10 feet and its horizontal position made mining operations simple. Expensive shafts and hoisting equipment were usually unnecessary and there was no drainage problem. The coal was easily reached by horizontal drifts driven into the face of the hillside and the cars in which it was brought out were in some instances routed directly into the yards of mills and factories along the waterfront at a cost to the consumer in the fifties of as little as 80 cents a ton. Concentration of ownership in the Pittsburgh-Connellsville district was eventually to develop to almost as great a degree as in the anthracite region but before 1860 the abundance of cheap coal lands and the relatively small capital investment required for mining operations under highly favorable physical conditions kept the fields in the hands of small-scale enterprise.

During the early decades of development, mining operations were car-

ried on most actively along the banks of the Monongahela for some distance above Pittsburgh and were greatly facilitated by the improvement of navigation on this stream by locks and dams, operated privately on a toll basis. This slackwater system permitted coal to be mined and loaded in flatboats much of the year and insured an uninterrupted supply to meet Pittsburgh's rapidly expanding industrial needs. Large fleets of coal boats assembled in the lower pools of the Monongahela awaiting the flood stages that would carry them down the Ohio River to the markets below. The early industrial growth of Cincinnati, Louisville, and, in less degree, St. Louis was largely fostered by Pittsburgh coal. By 1845 nearly 2,000,000 bushels of coal were consumed at Pittsburgh and exports down the river from the lower Monongehela mounted from over 2,500,000 bushels in this year to more than 16,000,000 bushels in 1855. Although mining operations were most intensive in the Pittsburgh district, bituminous fields were worked in a number of other districts in the Appalachian region and the Mississippi Valley, especially in the Wheeling and Kanawha districts and on and near the Ohio River in Kentucky, Ohio, and Indiana. Anthracite rather than bituminous coal was the primary industrial fuel of the *ante-bellum* years. The average annual production of bituminous coal in the fifties was under 5,000,000 tons, and it was not until the seventies that it assumed the leadership it has since held.

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CHAPTER 12

Light Manufactures and the Beginnings of Precision Manufacture Before 1861

American Manufacturing Before 1790

AT THE END OF THE REVOLUTION the United States was not only politically disrupted but was in economic straits. The difficulty of obtaining manufactured goods from abroad during the war had inevitably encouraged some new experimental domestic manufactures, though households had made shift to do with what could be contrived at home. But with the peace came a flood of European goods to meet the accumulated demand, and the country soon found itself faced with the prospect of being tied economically to Great Britain or France as tightly and helplessly as before the war. Hard money was scarcer than before, and peacetime production of foodstuffs and goods for export was slow in gaining headway. And still European manufactures came pouring in.

At the first session of the Federal Congress a petition for protection of American manufactures was presented by a group of artisans and mechanics of Baltimore. Similar appeals from New York and Boston followed almost at once. Congress promptly effected some relief by placing duties on a number of articles, among them candles, soap, cables and cordage, leather, hats, slit and rolled iron, iron castings, nails, unwrought steel, paper, cabinet ware, carriages, tinware, wool cards, and anchors. This specific act, virtually the first passed by the new Government, strengthened by the existence of a centralized authority with power to apply such measures, inspired confidence in the future, and American manufacturing enterprise began to feel its way toward a capacity calculated fully to meet domestic needs.

The extent of Colonial manufacturing and the expansion of American productivity before 1785 has been discussed in Chapter 3. Luxuries were the chief items of import after, as before, the Revolution. Most household necessities continued to be made at home or at the village smithy or wheelwright's shop. Usually every community had its tan-works, its sawmill and gristmill, and often its fulling mill as well. Pottery, salt, firearms, paper, and the small amount of glassware in use were frequently of American manufacture; but as these articles could not be made without special equipment and skilled workmen, the

number of establishments for these manufactures was limited. Yet by 1791 Hamilton could report considerable progress in American manufacture of a long list of consumers' goods, in making many of which he believed the country, given proper encouragement and protection, might soon be self-sufficient. There were in the thirteen states some 70 paper mills, a cotton-yarn mill operating with American-made approximations of Arkwright's spinning frames, a woollen mill in Connecticut that made the broadcloth worn by George Washington when he delivered his first annual message to Congress, several successful glassworks and potteries, numerous brick kilns, and a great many small forges and blast furnaces for iron smelting.

Initial Impetus

The early development that was to have the most marked effect upon American manufacturing, the introduction of power-driven machinery for cotton manufacture, had started in 1789, in response to the rewards offered by state legislatures and the Pennsylvania Society for the Encouragement of Manufactures, for workable spinning or weaving machines. To the accomplishment of Samuel Slater, whose ingenuity was largely responsible for the success of this undertaking, it will be necessary to return later. Suffice it here to point out that the determination of Americans to be free of dependence upon European manufactured goods proved a constant stimulus to the inventive in every line; the Government bounties and subsidies that were established after Alexander Hamilton's report had made clear the wisdom of such a policy helped the financially weak enterpriser and encouraged the launching of many manufacturing attempts. The creation of the patent office in 1792 was a further step in the right direction. During the last decade of the eighteenth century dozens of mills sprang up, many of them doomed to shut down in the course of a few years, but more often for lack of adequate financing, owing to inexperience of the owner, or for scarcity of trained labor, than for want of ready markets.

Although unpopular in many sections of America, the Embargo in 1807 intensified efforts to produce American manufactures, and the War of 1812 still further accentuated the necessity for goods made at home. Merchants who would perhaps have preferred to import commodities of known quality were obliged to finance and abet in every possible way manufacturing in this country in order to obtain adequate supplies of goods to sell.¹ The impetus thus given by harsh circumstance as well as by patriotic sentiment was not again to be lost, and although some of the great mercantile houses were later to divert their

¹ See F. W. Taussig, *Some Aspects of the Tariff*. Cambridge: Harvard University Press, 1915.

interest in American manufacturing back to foreign trade, many continued the financial support begun of necessity.

The Rise of the Textile Industry

The strides made in manufactures before 1816 were most notable in two fields, of which the earlier and most immediately outstanding was textiles. Because in England the introduction of power-driven machinery had been most effective and complete in yarn and cloth manufacturing, it was logical that the Industrial Revolution should find its first foothold in America in the same enterprise. All through the 1780's attempts had been made in this country to build carding and spinning machines, patterned either after English inventions or original drawings. But full success had to await the arrival in Pawtucket, Rhode Island, of Samuel Slater in 1790.

Slater, a gifted and ambitious mechanic, had been employed in Arkwright and Strutt's plant in Milford, England, for several years when reports of the money offered by an American society for models of textile machinery induced him to emigrate. Since British law strictly forbade export of drawings or models of the revolutionizing machines, and indeed emigration of mechanics, Slater spent some time in studying the details of Arkwright's frames, and only when he felt competent to reproduce them from memory did he sail incognito for America. Contact with two men of means in Providence, William Almy and Moses Brown, quickly produced an agreement that Slater build necessary machinery and supervise the erection of a mill, in which he himself was to have one-half interest. The neighborhood of Providence had already a fairly well-established handicraft cotton industry, producing chiefly candlewicks and yarn made upon hand jennies. But Slater refused to use the spinning frames Almy and Brown had endeavored to make work, and built new ones. By 1793 the firm of Almy, Brown & Slater was operating a 72-spindle mill, and the patenting of Eli Whitney's cotton gin the next year insured ample supplies of cotton. By the end of the century, the success of the Slater mill had been duplicated by several others, and before 1810 Gallatin reported some 50 cotton-yarn mills north of the Potomac River. A memorial to Congress in 1815 stated that there were within 30 miles of Providence 140 cotton manufacturers employing 26,000 hands and operating 130,000 spindles. The American textile industry was launched.

Cotton manufactures, rather than woolen, were the first products of the new machine-equipped plants, doubtless because homespun woolens (albeit frequently machine-carded) were easier to produce by the old processes than were cottons. Nevertheless, factories for woolen manufacture soon followed. Interest in growing wool was slower to make headway in the United States than in cotton raising, and the woolen

industry may well have been affected by the problem of procuring adequate supplies of the raw material. But wool-carding machines had been built in America before the end of the Revolution and the spread of factories for carding and dressing wool for home weaving was rapid after 1795. Even carpet manufacturing was begun in Philadelphia about 1791.

Arms Manufacture

The other industry in which America made extraordinary progress before 1816 was the manufacture of firearms. The advance was less generally recognized, and it less promptly affected the whole American economy than did the new textile mills, although ultimately changes in methods of small-arms manufacture were to be of even greater consequence. For in this enterprise was developed the system of interchangeable parts, a technique acknowledged many decades later to be the key to mechanized mass production.

The desperate need for American-made firearms had been obvious all through the Revolution, and small gunsmithies had multiplied and continued to turn out muskets after the war was over. But Congress, early aware of the urgency of making the country completely free of reliance on foreign arms, in 1792 authorized the creation of two national armories and a few years later generously subsidized several private contractors to make muskets, pistols, and rifles for the Government. The superintendents of the national armories in Springfield and Harper's Ferry and the half-dozen private enterprisers engaged in this manufacture from the beginning pooled their experience. It is impossible to assign to any one of them exclusive credit. To perfect machines accurate enough to turn out parts wholly interchangeable was an ambition common to them all, and each man probably contributed something to the final achievement.

Eli Whitney, best known as inventor of the cotton gin, had attained some success in interchangeability as early as 1800;² and Simeon North of Berlin and Middletown, Connecticut, working independently, arrived at the same goal before 1808.³ Crude screw augers, power-driven

² Interchangeability in manufacturing firearms had originated in France and Thomas Jefferson in the 1780's, having visited the shop where the scheme was being tried, wrote home with enthusiasm of its possibilities. But in France it was soon dropped as impractical. French and British armament makers therefore derided the idea of interchangeable manufacture as visionary. Skepticism began to prevail in the United States War Department also. To prove the feasibility of his methods about the year 1800, Whitney took to Washington the parts for ten complete muskets. In a dramatic demonstration before the Secretary of War and chief Ordnance officers he selected at random from the piles of parts and before the eyes of the doubting officials assembled ten perfectly fitted guns.

³ North wrote to the Secretary of the Navy in 1808, "I find that by confining a workman to one particular limb of the pistol untill he has made two thousand, I save at least one quarter of his labour, to what I should [otherwise have] provided I finished them by small quantities; and the work will be as much better as it is quicker made. . . . I have some seventeen thousand screws and other parts nearly finished and the business is going on brisk and lively."

trip hammers for barrel-welding, and drilling jigs were the earliest machine tools devised for arms making, and both Whitney and North as well as Asa Waters in Millbury and the Government armorers had each his own variation of workable machinery. North's contract of 1813 for Government pistols, based upon his success with this interchangeable method of production from 1808 on, is the first contract known to have stipulated expressly that the arms were to be manufactured with wholly interchangeable parts.

Eli Whitney, one of the first great inventors and gunsmiths of America, was born on a Massachusetts hill farm in 1765. At the age of 15, he persuaded his father to allow him to start a shop for making iron nails, and until the end of the Revolution he carried on a thriving business. With money earned by this and later undertakings, he went in 1788 to Yale College and acquired the education earlier denied him. During a sojourn in Georgia in 1792 he learned of the problem confronting Southern cotton growers, namely the need of mechanical means of removing the green seeds from short staple cotton. In a few weeks he had built with self-made tools a workable gin, the basic principles of which have never been altered. The immediate and far-reaching consequences of this invention cannot be overestimated, but its pirating and the ruinous law suits that followed so discouraged Whitney that in 1798, backed by a Government subsidy, he turned his mechanical genius to gun making. His bitter experiences in vainly trying to protect his patent rights in the cotton gin led him thereafter to seek no patents for the machines he built in his armory in Whitneyville, but there is ample testimony to the importance of the automatic devices he installed for arms making. His educated bearing and personal charm won for him a host of admirers, while his fame as the inventor of the gin made him a national figure. His influence among men of affairs at the time of his death in 1825 was enormous.

Simeon North, on the other hand, was comparatively little known. Born in Berlin, Connecticut, in the same year as Whitney, he never acquired an education comparable to that of Whitney and until late in life he had few outside contacts. His great native gifts, his tenacity of purpose, and his deep-seated patriotism alone enabled him to make outstanding contributions to American mechanical development. This lean, taciturn, Connecticut Yankee, like Whitney, took out no patents and gave freely the benefits of his skill and experience to his Government and to his fellow contractors. Over a period of 53 years he constantly improved upon his own methods of production, and at his death in 1852 he had perhaps done more to place American interchangeable manufacture upon a mass-production basis than any other one man.

Connecticut clockmakers, following closely in the wake of the gunsmiths, were the first to apply the interchangeable part system to another line. In fact, Eli Terry and Seth Thomas are believed to have made

some 4,000 grandfather clocks between 1807 and 1810, starting work upon 500 at a time. While the wooden works of these clocks were far easier to reproduce exactly in quantity than the steel or iron parts of guns, the necessity of accuracy in producing interchangeable parts of time-pieces makes the tooling accomplishment of these early clockmakers notable.

Problems of the Manufacturer Before 1816

Despite the early enthusiasm for national self-sufficiency the difficulties attending the development of manufacturing upon any scale were overwhelming. Not only were the patterns of the first machines for factory production hard to acquire, but the necessary capital to start even a small mill was not easy to command. Unlike the armament makers, ambitious enterprisers in other lines could not rely upon Government subsidy to supply the initial funds needed. Mercantile capital was naturally the most ready source, but merchants were frequently loath to risk their resources in a comparatively unfamiliar field, and not until trade was cut off by threat of war or war itself were many persuaded to invest in industrial ventures. The story was nearly universal; it was repeated in New England, in the Middle States, and in the West. Men of means, and they were not numerous at best, preferred to speculate in land purchases or to enlarge their spheres of trade rather than to back manufacturing projects. Banking facilities were meager and managerial experience in any kind of manufacturing was virtually nonexistent. The generation of Americans between 1785 and 1815 moved cautiously and rather reluctantly into industrial investment. Small mills on small streams were the rule, with little capital, local workmen, and localized markets.

The initial problem of finding capital was complicated by that of obtaining labor. Indeed, even with ample financial backing success was frequently dubious because of the difficulty of keeping trained workmen in the plant. Skilled men could be imported from Europe and apprentices and journeymen bound to learn a craft, but with the lure of free opportunities in the West it was impossible to keep them long. Baron Stiegel, who had poured money into his glassworks in Pennsylvania in the 1770's, had been obliged to close down largely because the hands he brought from Europe at great expense worked out their passage and then, without exception, departed. Labor supply was often a wholly insuperable problem. Dependence upon trained men and women living on farms or in homes in the immediate neighborhood to some extent solved the problem.

Two other difficulties confronted the manufacturer all through the experimental period: lack of power to drive machinery, and want of transportation facilities for shipping raw materials and finished goods.

Before 1815, and in fact generally before 1835, water had to supply the power, and few were the streams that never ran dry in summer or froze up in winter. Occasionally on great rivers like the Connecticut, construction of wing dams could divert enough water even in midsummer to turn mill wheels, but it involved a costly and hazardous engineering feat. Even the great Government armory at Springfield relied exclusively for power upon a small tributary to the Connecticut, a source that gave out usually for several weeks in July and in most years for much of December, January, and February. Similarly, before the days of steam, transportation generally waited upon the weather, for where carting cross-country was not prohibitively expensive, ox teams and horses could not draw heavy loads over snow-drifted roads in the winter or muddy morasses in the spring. Unless the mill were located very near the coast, shipments in and out were confined to spring, summer, and fall. The transportation problem served one useful purpose in this early period, however. It raised around the local enterprise a protective barrier that enabled many a small concern to build itself into financial security because it could market its goods locally on a virtual monopoly basis. When improved roads and waterways opened up the local market to competition, the original safeguard of monopoly was no longer essential.

Effect of the War of 1812

The end of the War of 1812 introduced a new phase in American industry. Just as European goods came pouring in after the Revolution, so during 1815 British and French manufacturers dumped quantities of goods into the hungry American markets. American merchants who had supported American manufacturing began to return to their Old World suppliers, and capital, only recently and very tentatively diverted to industry in this country, was in many cases withdrawn to finance an extension of foreign markets for American agricultural products. But public indignation was aroused and the outcome was the passage of the tariff of 1816, a measure supported by the South as well as the North, doubtless for sentimental rather than economic reasons. The protection was sufficient to stem the tide somewhat, and American mechanical ingenuity was spurred to find means of competing with foreign goods. Improvements in all types of machinery began to multiply; the power loom was introduced in textile manufacture, lathes and screw-cutting machines were patented, Fourdriniers or the more newly invented cylinder machines began to appear in paper mills.⁴ Native mechanics and skilled

⁴ The Fourdrinier, invented by a Frenchman during the French Revolution, was built commercially and first put into operation in Great Britain. Its principle was really an adaptation to a machine of the old hand process of screening. The liquid pulp, "half-stuff," was fed by gravity onto one end of a moving, vibrating screen that meshed the fibers. The wet, matted sheet was picked up at the other end of

artisans in every field increased in numbers, and the movement toward effective industrial development slowly gained momentum.

The most marked progress was shown, as before, by cotton manufacture and small-arms production. Before 1815 cotton mills had been almost exclusively yarn mills, with the weaving "put out" to women in the neighborhood to be done on hand looms at home. Only a few manufacturers had undertaken to have cloth woven in the factory, and under the old system there was no urgent reason for such an arrangement. But the power loom, first set up in Francis Lowell's mill in Waltham in 1814, changed this situation. This Boston merchant had visited English cotton factories and brought back a description of the power loom. His memory of its details, however, proved too inaccurate to be reliable and his new company, the Boston Manufacturing Company, depended rather upon looms built and installed by an American mechanic, Paul Moody. Accustomed to dealing in large sums of money, accepting great risks, and expecting huge profits, Lowell envisaged a wholly new form of the industry, in which a large initial capital to draw upon and complete mechanization, and therefore full factorization, of all the processes of cotton-cloth making should place the American industry upon a large-scale basis. The new era in cotton manufacture that Lowell's company and its imitators inaugurated was important not only because it marked the creation of vertically integrated mills, but because the whole system was predicated upon extensive fluid finances.⁵ The improved methods of manufacturing cottons so lowered prices that the domestic market was enormously expanded. In large areas of the back country, where homespun woollens and home-woven cottons had served, the marketability of cheap cotton goods rose quickly as people discovered that their time was more profitably employed in other ways than in household manufacturing. As early as 1822 building of cotton mills had assumed such proportions that Colonel Lee, writing from the Springfield Armory about the threatened exodus of skilled mechanics to Rhode Island, declared that he could not keep his best workmen without pay increases—"the rage for manufacturing cotton prevails to such a degree."

But woolen manufacturing also took a forward leap during the twenties. New shearing machines and better cards and looms turned out finer materials in the bigger mills. The power loom was adopted

the screen by a felt-covered roller and fed between two other rollers that squeezed out more of the excess water than could be shaken out through the screen. The paper that emerged might be one continuous sheet, provided the machine tender could maintain the machine in smooth operation. The cylinder machine picked up the half-stuff from a shallow pan direct onto a roller, but it could not achieve the evenness and fineness of the papers made by the screening of the Fourdrinier.

⁵ See Caroline Ware, *The Early New England Cotton Manufacture*. Boston: Houghton Mifflin Company, 1931.

more slowly for woollen manufacture than for cotton, partly because the woollen industry as a whole was less quickly established upon a full factory basis of production and partly because woollen warps were less readily adapted to the strain of mechanized weaving.⁶ However, by the 1830's power looms had been installed in the plants of most successful manufacturers. Meanwhile, through the century small woollen mills sprang up, often equipped with makeshift machinery, but locally financed, locally supplied with wool, and operated by the children and older daughters of local farmers.⁷ Although many of these undertakings were in time abandoned as improved transportation brought wider competition, the increase in numbers before 1830 served to strengthen the growing conviction in the United States that America had important industrial possibilities.

Meantime, an extraordinary advance was made before 1832 in developing machines accurate enough to eliminate many hand processes in gun manufacture. It was not by chance that the services of machinists of the armories were in demand. Although in the years before and during the War of 1812 arms manufacturers had been experimenting with various types of power-driven tools, belt-driven trip hammers for welding, screw augers for boring, and lathes for turning barrels, reasonably satisfactory results were not reached much before 1820. As in any exacting science of mechanical art, while the principle may be clear, it is upon the perfection of the instruments or tools that the adequacy of the outcome must rest, so it was primarily in making more accurate the performance of earlier crude machines that the progress of the next decades was to come. As yet nothing had been achieved that in any modern sense could be labeled precision manufacture, but constant improvement and refinement was pointing the way. Probably the only really new invention of note in the twenties was Thomas Blanchard's gun-stocking lathes, machines that in about a minute and a half turned the stocks and cut in the locks, with great improvement in accuracy and with considerable saving of operating costs. Blanchard's stocker with only minor improvements was to be used in all important American armories down to the War Between the States and was manufactured for export to Great Britain during the Crimean War.

Achievements of the Experimental Period

Thus, by 1830 the potentialities of America as a manufacturing nation were beginning to be seen. In consequence, the apprehensions of far-

⁶ The development of fabrics with cotton warps and wool fill early provided one way around this difficulty.

⁷ An interesting detailed account of woollen manufacturing is to be found in Arthur H. Cole, *The American Woollen Manufacture*. (2 vols.) Cambridge: Harvard University Press, 1926.

sighted men in the South were aroused and the long-drawn-out struggle between the advocates of free trade and the proponents of protection was born. In order that Congress might have authentic information about the extent of manufacturing in the United States from which to judge the wisdom of tariffs, the Secretary of the Treasury was instructed in 1831 to make a careful survey of manufacturing enterprises in the states and territories. The McLane Report is the first detailed census of manufactures in the United States and though by no means exhaustive it gives a clear idea of the character and extent of American industry at the end of the nation's first 42 years. The reports of manufactures came in from only 11 states, the activities of the West being included in the report from Ohio. As manufacturing areas, the seven Southern states could be utterly disregarded.

The outstanding achievements were largely those of four states: Massachusetts, Connecticut, Rhode Island, and Pennsylvania; the New England states led in textiles, clocks, boots and shoes, woodenware, and tools, Pennsylvania, in glassware, iron, and paper. But already Ohio and the West were making headway, as the population grew and as local markets expanded more rapidly than river transport could supply them. Household manufacturing lingered on in the back country, but after 1824 cheap cotton goods rapidly supplanted all but homespun woolens. In the Miami River valleys alone there were three cotton mills, five woolen mills, and eight paper mills. Cincinnati had begun to manufacture hats, chairs, and cabinetware for export to the South; and in Kentucky were hemp-bagging mills for Southern cotton. In this region steam power was early put to use, as the ready accessibility of wood and coal would make logical, and iron manufacture for nails, agricultural tools, and other consumers' goods developed rapidly.

As the questionnaires appended to the statistical data called for by the Federal marshals were designed to provide evidence for and against the need of continued tariff protection, a considerable mass of information comes to light about the financial status of American manufacturing enterprises. In the Eastern states some firms professed to find domestic as well as foreign competition so great that their profits were cut to a meager 6 or 7 per cent; whereas in Ohio and the West, where distance and poor communications served as natural protection, capital generally demanded a return of 15 to 20 per cent on any industrial investment, since manufacturing was there still considered speculative. But every report dwelt upon the disasters that would befall if the tariff were lowered. By modern standards, most of the concerns were small, with capitalization of a few thousand dollars, frequently less; proprietorships and partnerships greatly outnumbered corporations, and the number of employees rarely exceeded 50, save in the textile mills. American industry could still be termed supplementary to agriculture and commerce.

Spread of the Factory System Before 1850

But the experimental period was over. Overwhelming problems had been solved, reverses weathered, and manufacturing was soon to be universally accepted as a legitimate, nonspeculative business. Not until the middle forties, to be sure, were industrialists to feel sure of their place in the American scene, but just as the twenties brought the widening of merchants' interest in manufactures as an investment, so the thirties saw the spread of factories, the beginnings of mechanization in many fields, and the multiplication of kinds of manufacture undertaken in America. Money for new textile mills was easier to enlist, paper makers began to install machinery made in American shops, some Massachusetts bootmakers and shoemakers established small plants for partly mechanized production, and tool-making began to emerge from the local blacksmithy into shops equipped with trip hammers and power-driven forges.

The reasons for this acceleration are not hard to find. Years of profitable mercantile ventures had increased by many times the amount of money available for investment. Banking facilities and new insurance companies eased financing for the newborn enterprises, and although the panic of 1837 hampered manufacturers like everyone else, the ensuing wariness of capital about land speculation probably shortly redounded to the benefit of manufacturing interests. Furthermore, the unquestioned success of many mills naturally led to the building of others, sometimes by attracting new money, not infrequently by the process of reinvestment. Of the stockholders in the New England cotton mills of the thirties, there were few who had not been among the backers of mills built in the twenties.

Success in one field quite naturally led to experiment in another. For example, the early textile concerns generally built in their own shops at least part of the machinery for their expanding plants. In time the machine shop was detached from the parent company and, as an independent unit, might produce many kinds of goods besides shafting or textile machinery. Tools, various household wares, cutlery, all could be and often were made during the thirties in shops originally developed by textile capital. Indeed, the capitalists of the cotton industry promoted industrialization in many ways. Because of the extent of the funds necessary to build great dams and canal systems, to secure title to the adjacent land for mill sites, and then to finance the erection of the factories, the original group of enterprisers not infrequently acted primarily as a power and real estate company whose manufacturing interests were largely subsidiary.⁸ Finally, backers of the railroads in

⁸ The development upon the Merrimack of Lowell and Lawrence and upon the Connecticut of Holyoke are outstanding examples. In the last instance, the in-

the thirties and forties were eager to see more than agriculture developed in the country through which the new roads ran. To create freight for these roads many a new factory was launched in what had been inaccessible back country, not necessarily because the mills were sure investments, but because they guaranteed the investment in the railways. The problem of finding capital for manufacturing was pretty well solved.

Meanwhile the textile industry was aided by a notable technical advance in weaving. In the late thirties the invention of the Crompton loom permitted mechanical weaving of elaborate patterns and eased much of the pull upon the warp yarns, enabling woolen weavers as well as cotton manufacturers to put it to use. With the greater complexity of construction of these new looms and the use of metal frames and parts instead of wooden, production of textile machinery after the mid-forties became the province of specialized machinery companies rather than of subsidiaries of cotton or woolen concerns.

The increase in numbers of mills and diversification of kinds of mechanized shops served to train an ever-growing group of skilled workmen, although, of course, the demand for such men was growing even faster than they could be trained. In remote Vermont wheelwright shops or in bigger machine shops nearer the business centers, country boys apprenticed to masters had by the middle thirties already been schooled in the use of water-driven lathes, and, armed with Oliver Evans' *Young Millwright*, were acquiring a sound, technical education that was to produce a host of able mechanics and inventors to revolutionize American industry in the course of a generation. Evans' notable contributions as the inventor of the high-pressure steam engine are discussed in Chapter 11, but equally important, perhaps ultimately more significant, was his service as a teacher of the theory and techniques of hydraulics. His book, published in 1795, went through 15 editions before 1860 and before mid-century was in the hands of nearly every competent millwright in America. One of the least appreciated and most gifted men the United States has produced, Evans profited little from his work, but he spoke truly of the value of his book when he said:

... the Millwrights' and Millers' Guide, containing some eternal truths, true theories, which will, like Euclid's Elements, stand the test of time, and lead no practitioner into an expensive error. I supposed it would have sold most rapidly, but was disappointed. . . .

Two thousand copies were published. . . . My agents carried them to show the millers and millwrights, and gave a great proportion of the edition to them, by orders from me, for the purpose of getting my improvements introduced.

vestors overreached themselves by tying up so much capital in the power development and in slow-selling real estate that they were unable to weather the financial storm of 1857. See Constance M. Green, *Holyoke, Massachusetts*. New Haven: Yale University Press, 1939.

One of my agents traveled for thirteen years, to instruct millwrights and millers to make and use the improvements . . . ; he often declared his belief that he rode 100,000 miles.⁹

It was not until long after his death that the benefits of Evans' knowledge and inventions were widely spread.

Apart from the specially skilled, the labor situation was also eased by the greater readiness of respectable farmers' daughters to undertake mill work. Francis Lowell, in launching his cotton mill in 1814, insisted upon proper living conditions for the help, and accordingly he had boarding houses built where careful supervision could be maintained over the young women who came in from the New England farms to work for a winter or two in the factory. The Waltham system spread through much of the New England cotton industry, and unquestionably helped to banish doubts about the propriety of mill work for any healthy country girl. In consequence, the labor supply was tremendously augmented.

Furthermore, transportation and power problems were greatly lessened by the end of the thirties. Steam engines were no longer a rarity, and in the Middle States and accessible parts of New England coal was coming into use. Factories no longer depended upon water power alone, and year-round operation, unaffected by drought or frozen streams, could insure a success hitherto doubtful. Steamboats plied regularly on all the navigable rivers, and railroads were building. The coming of the railroads not only opened up markets in the back country, often incidentally destroying local monopolies, but accelerated industrialization in various ways. As has been said, railroad money was ready to launch new manufacturing communities, while, with the spread of the railway network, resources of power or raw materials earlier too inaccessible for exploitation became available. It is not without significance that in 1837 Massachusetts, the leading manufacturing state in the Union, issued its first census of industry, a statistical survey that showed scarcely a town without some small manufacturing establishment. By 1845 when the second industrial census was made, the advance in numbers of plants, in numbers of hands employed, and, most of all, in value of goods produced, was impressive. In this progress the railroads had played an important part.

Mill Labor Before 1850

Although the "putting-out" or "domestic" system as it had been organized in Great Britain had no substantial counterpart in America, and the establishment of factories therefore necessitated no similar

⁹ Greville and Dorothy Bathe, *Oliver Evans, A Chronicle of Early American Engineering*, p. 47. Philadelphia: Historical Society of Pennsylvania, 1935.

drastic readjustment of the national economy, still the spread of factories for the manufacture of consumers' goods involved, as time went on, a sharpening differentiation between employer and employee. Improved transportation and communication, through destruction of the purely local monopoly market, abolished some of the small mills and fostered a keener competition that made the question of wage rates for factory hands more acute. For whereas mill owners in the early thirties had paid their help whatever was necessary to induce the neighborhood farmers' sons and daughters to work in the plant, by the forties employers might draw labor from a much wider radius. Furthermore, the extraordinarily close interconnection of all the New England cotton textile concerns standardized wage rates and working hours, leaving the workers comparatively helpless in bargaining.

A native American labor movement had sprung up in the late twenties and flourished for a decade or more, but its strength derived from urban artisans rather than from mill hands, and its program was concerned not with wages but with hours, educational opportunities, and mechanics lien laws. The introduction in 1836 of the 10-hour day in the Government navy yards and its later extension to all Federal employees made no dent upon the regime of private employers, and the fairly widespread use of gas illumination in mills after 1840 made a 12-hour day as general in winter as in summer. During the forties a new labor movement arose, this time sponsored by mill workers. As long hours were easily the most vulnerable point of attack, it was first and foremost a 10-hour movement, although success would doubtless have quickly inspired attempts to secure better wages. Corporations, creations of the state legislatures, were logically subject to regulation, but the political power of mill owners sufficed to defeat suggested reforms. By 1848 the operatives had largely abandoned the attack.¹⁰

Nevertheless, factory work was not considered hopelessly degrading, as it had been in England. In 1840 the girls in the Lowell mills began the publication of the *Lowell Offering*, a collection of essays, romantic and realistic, written by members of their own "Improvement Circles." The tone of these papers is, to be sure, defensive, constantly reiterating the dignity and value of factory employment.¹¹ And, it is true, conditions in the mills that adopted Lowell's pattern were distinctly better

¹⁰ The best compact discussion of the condition of mill workers of this period is contained in Norman Ware, *The Industrial Worker, 1840-1860*. Boston: Houghton Mifflin Company, 1924.

¹¹ Harriet Martineau, that shrewd English observer and essayist, after visiting the Waltham mill in 1834 wrote a most eulogistic account of the industrial community she found. "I saw a whole street of houses built with the earnings of the girls; some with piazzas and green Venetian blinds, and all neat and sufficiently spacious." The contrast to English mill towns was inevitably sharp, but had Miss Martineau observed the American scene a decade later she must have noted much to trouble her. See Martineau, *Society in America*, especially Volume II. London: Saunders and Otley, 1837.

than in the Rhode Island factories, which, following Slater's English conception, made no attempt to supervise the workers' lives. The latter *laissez-faire* arrangement had none of the annoying paternalistic features of the Puritan Massachusetts system, but child labor was more extensive and mill agents tended to consider their operatives as part of the machinery; and a Fall River manager frankly stated, "So long as they can do my work for what I choose to pay them, I keep them, getting out of them all I can." But until the general influx of Irish and French Canadian immigrants into the mills in the late forties and fifties, the character of labor in American industry was of a singularly high order. Massachusetts in 1837 required for all child employees under 15 years of age three months' schooling a year, and although for another 30 years there was to be no system of factory inspection to see that the law was enforced, the humanitarian gesture was a source of pride to Massachusetts employers.

Industry Outside the Factory System Before 1850

It would be a mistake to think of American manufacturing enterprise before 1850 as functioning fully on a factory basis. Although complete home manufacture had largely died out before 1850 even in the West, many products were made on a partial "putting-out" system. And, indeed, there is evidence of this system's enduring long after the War Between the States, when modern industrial methods are frequently considered wholly to have superseded the less centralized regime. It could be used, of course, only in fields not fully mechanized. But these were still numerous. Even in paper making the introduction of machinery was slow, although ever since the seventeenth-century beginnings of the industry in America a power-driven mill with special equipment and trained workmen had been necessary. In the middle forties a number of small paper mills still relied upon hand processes. The "putting-out" system, as such, prevailed primarily in the manufacture of boots and shoes, of palm-leaf and straw hats, and, after the invention of the sewing machine in 1846, of ready-made clothing. In rural New England quantities of "tops, taps, and fixings" for boots were distributed to farm families by the entrepreneur who in time collected the finished work at so much a pair. The invention of shoemaking machinery in the fifties only very gradually drove out this system. The same scheme obtained in hat making, in some localities in the sewing together of machine-knit stockings, and in the finishing of men's ready-to-wear shirts, caps, and pants. It was leisure-time occupation—if leisure in rural America before 1870 be not a total misnomer—and men, women, and children alike gladly supplemented returns from farm or country store¹² with

¹² In many remote sections barter between country merchant and country customer endured longer than is sometimes realized.

earnings in real money. In urban communities, however, such home-work tended to become the main source of livelihood, and the shockingly low rates of pay necessitated appallingly long hours.

Era of Industrialization, 1850-1861

By mid-century, then, manufacturing, whether in factory alone or in factory plus home, had earned a secure place in the American economy. The agrarian South, intent upon the defense of its "peculiar institution," watched with increasing alarm the growth in wealth and population of the North and Northwest, but neither sentimental disapproval nor gradually lowered tariff schedules could check industrial development. Abundant raw materials, greatly improved transportation, far-flung markets, an ever more highly skilled force of mechanics, increasing use of machinery that made feasible employment of unskilled labor, accumulating capital—all pointed to industrial progress. Every year added new mills and new types of manufactures until the agricultural Arcadia envisaged by Jefferson was doomed.

One evidence of the rapid multiplication of factories requiring considerable machinery and hence larger capital than individuals or partners could generally command is the passage in most Northern states of general incorporation laws in lieu of the special legislative acts theretofore resorted to. Save in the cotton industry, capitalization was still comparatively small, and paper makers, agricultural tool makers, woodenware and carriage makers, and hosts of others could launch their corporate enterprises on financial shoestrings.

Importation of Labor

To man these new mills more hands were needed than even prolific America could provide. The potato famine in Ireland and the political upheavals on the Continent brought to the New World in the late forties and early fifties great numbers of immigrants, of whom the Germans in particular were often skilled workmen. But the lure of the unsettled West, let alone the discovery of gold in California, made it difficult to hold the mill hands in the manufacturing East. The device of importing labor under contract was therefore hit upon, and agents began to scour European cities and French Canadian villages to engage workers for American manufacturing concerns. The agent, paid so much a head for every person signed on, was usually instructed to bring, if possible, hands with some experience in operating machines. Frequently, however, this was impossible, and raw boys and girls from Irish or Canadian farms were brought into the United States, bound to work out their passage money and any other cash advances made them by months of labor in the mills.

It is easy to exaggerate the hardship this scheme imposed upon the

immigrant. Apparently before the War Between the States most people so brought to the States were eager to come and did not regret it later. But it is also easy to comprehend the wrath of the Southern slaveholder who, cut off from the African slave trade and subject to attack from Northern abolitionists, reviled the hypocrisy of the Northern industrial slave trader. Had the increased efficiency of the machinery in manufacturing plants not eliminated the need of any great degree of skill on the part of the operative, such wholesale importation of unskilled labor could scarcely have been economical for the employer. As it was, however, the use of this method of securing factory hands right down to the War Between the States intensified the friction between North and South.

But resentment of the system was by no means confined to the slave states. Native American mechanics and artisans viewed this flood of cheap immigrant labor first with distaste and shortly with outright hostility. Workingmen's Leagues, composed almost exclusively of native Americans, in the early fifties renewed their efforts to get the enactment by state legislatures of a 10-hour law, and with the failure of that attempt angrily threw their political weight into Know-Nothingism, a short-lived endeavor to freeze out the immigrant from participation in the economic and political benefits of American democracy. The earlier conception of the community of interest between employer and employee gave way before the idea of every group for itself, and the general Trades' Union movement of the thirties was not vigorously revived. Only the Typographical Union of printers and typesetters came into permanent being. American labor unions were to emerge only a full generation later when the closing of the frontier and the increasing weight of the capital structure of American society hampered free opportunity for every man to creep up the ladder to economic security by his own efforts. Meanwhile, with the influx of foreign workers into the mills, American farmers' daughters ceased to regard factory work as "pleasant" and "honorable." The *Lowell Offering* dropped from sight, and the educated "female operative" of the forties was rarely found by the end of the fifties.

Precision Manufacture, 1832-1860

The rapidity of expansion and early efficiency of American industry was conditioned by the development of machine tools. The story of machine shops that supplied these tools belongs, after 1832, to the chronicle of heavy industry, discussed in Chapter 21. In the perfecting of interchangeable manufactures, however, the general machine tool played a lesser part than the introduction of precision gauges. Interchangeability of parts of mechanisms, a matter quite different from the production of articles virtually identical but not fitting permanently

into a mechanism, grew in exactness with every decade. But it must be remembered that the meaning of the term itself grew: "The interchangeability of 1813 would not have been considered satisfactory in 1855."¹³

Numerous improvements upon the machines of the earlier period were constantly introduced into the armories, public and private, during the thirties and forties—elaborated millers, grinding machines, and others. Clockmakers abandoned wooden works in favor of brass, a change that necessitated more carefully constructed tools and machines. But it was the *vernier caliper*, first made in America in 1851, that inaugurated true precision manufacture in the United States. Its maker, Joseph R. Brown, had been a clockmaker, repairman, and small producer of mathematical instruments in Providence for some years. In 1850 he had invented and turned out in his shop, where only 14 men were employed, an automatic linear dividing engine for graduating rules. Improved upon somewhat in the course of the decade, this machine was still in use in the 1920's, meeting modern standards of accuracy.

The new caliper, reading to thousandths of an inch, was the first practical tool for exact measurements that could be sold at a price within the reach of ordinary machinists. Its importance, therefore, can scarcely be overestimated, although its general adoption was astonishingly slow. The "*vernier*," named for the seventeenth-century French inventor who first evolved the principle, is an auxiliary scale made to slide along the divisions of a graduated instrument for indicating parts of a division. The *vernier caliper* is an ordinary rule fitted with two jaws, one rigidly fixed to the rule, the other attached to the vernier scale that slides along the rule. The instrument has both British and metric scales and is provided with devices to measure internal depths and also diameters of cavities. For the first time gunsmiths, watchmakers, sewing-machine manufacturers, anyone closely concerned with interchangeable manufacture, could measure the accuracy of their work without costly equipment.

Brown and his partner, Lucien Sharpe, shortly produced other valuable precision tools: vernier protractors, the American wire gauge for clock springs, and, soon after, a precision gear-cutter for clocks. With the coming of the War Between the States the firm embarked upon the building of a whole series of important machine tools. In the invention and construction of precision instruments, however, Brown's greatest

¹³ Joseph Wickham Roe, in his valuable book *English and American Tool Builders*, pp. 140-141 (New York: McGraw-Hill Book Company, 1926), illustrates this statement: "When Hall completed his first hundred rifles at Harper's Ferry in 1824, it is said that 'the joint of the breech block was so fitted that a sheet of paper would slide loosely in the joint, but two sheets would stick.' This system of gauging will have a familiar sound to the older mechanics who grew up before the days of the micrometer. When Colonel North was given his first contract for rifles and furnished two models to work from, these models were so unlike that he asked to have one set aside and that he be allowed to gauge his work from the other."

contribution other than the vernier caliper was the micrometer, put upon the market in 1867. Without these minutely exact gauges American interchangeable manufacture could never have achieved its high degree of efficiency. Other men and companies, of course, took up the making of precision gauges and tools. Most advances in mechanical invention are the work of many persons, and a great number of gifted mechanics carried further that of Brown and Sharpe.

No account of American precision manufacture before the War Between the States would be complete without mention of the Colt workmen. Samuel Colt had invented his revolver as early as 1836, but his pistols were not widely accepted as practicable until the Mexican War. In 1853 Colt built his own armory just south of Hartford, Connecticut, and there a corps of extraordinarily able workmen began the production of small arms on a basis of interchangeable manufacture in which machine work almost wholly superseded hand work. Under the direction of a great superintendent, Elisha K. Root, modern machine tools were developed and new standards of precision achieved that spelled a new era in American manufacturing. The progress well begun in the fifties was hastened by the demands of the War Between the States. Manufactures of the postwar period were to be produced with a speed and an accuracy unattainable before.

Shop and Factory Organization Before 1861

Armories and specialized machine shops were organized somewhat differently from mills producing textiles, paper, shoes, or ordinary household wares. In the former, highly skilled workmen were necessary and the so-called contract system, established early in the nineteenth century, was generally maintained until long after the close of the War Between the States. Under this arrangement, a competent master workman entered into a contract with the shop whereby, supplied with raw materials, tools, and power, he undertook to turn out the product of his department for a settled sum. He engaged his own workmen and set his own wage rates. The contract might run for a year or until the completion of a given job. Frequently, particularly in the early years, there was a kind of apprenticeship system that enabled the inexperienced boy to acquire a technical education under the direction of a skilled workman. One needs but look at the long list of eminent American mechanics and tool makers who got their training at Whitney's or Robbins and Lawrence, or Colt's or Brown and Sharpe's, to realize the value of the system. Whether or not it was because of the intimate association between contractor and his men that this arrangement created, the fact remains that in the nineteenth-century armories and precision machine shops, probably more than in any other industry in America, innate capacity had opportunity to express itself and to reap its rewards.

Occasionally the textile mills, at least the finishing departments, resorted to the contract type of employment. But usually the foreman or superintendent hired and fired, and the employee's name was entered upon the mill register with the department to which he or she was assigned. Pay days came monthly in the more adequately financed mills, but in some factories only every three or every six months. Nor were wages always in cash. The wages of the single employee, obliged to live in the company boarding house, had deductions for room and board, while married men and women might have to take payment in tokens redeemable only in goods at the company store.

Because textile mills employed greater numbers of persons than other manufactures, personal contacts between owners and operatives were fewer. The spread of corporate ownership also early involved absenteeism in the cotton industry, and even before mid-century many mill hands never knew the heads of the company by sight. Financial control and ultimate managerial responsibility was centered in Boston with underlings as "agents" in charge of the plants scattered through New England. The agent had to refer important decisions to the company treasurer in his Milk Street office, but to the mill employee the agent was the representative of all authority. That labor disputes and other paralyzing managerial difficulties were fairly few is surprising until one recalls that in the early decades the whole system was too new to seem immutable, and later the immigrant mill-population was too ignorant, too unfamiliar with the American scene, to make protest appear possible or effective.

In other realms of manufacturing, organization—financial and administrative—was less complete. Few paper companies employed more than 40 hands, and management was almost always vested in the principal owner. Absentee ownership was rare, for paper making was still considered an art that demanded careful supervision. Although labor turnover in paper mills was higher than in other lines, its rate was apparently largely attributable to a paper makers' tradition that able men roamed from one mill to another, always sure of getting jobs. Proprietorships and partnerships in the paper world were common long after they had virtually disappeared in the textile industry. Machinery had fully supplanted hand methods of paper making before 1860, but make-shift second-hand equipment could be bought with no great capital outlay, and a small mill faithfully tended could always sell its product, and usually profitably.¹⁴ Less highly mechanized industries producing various household wares: "Yankee notions," pots and pans, pins and needles, woodenwares, and the like, needed comparatively little capital

¹⁴ In 1851 the failure of a small paper mill in Massachusetts elicited the horrified comment from Joel Munsell in his *Chronology of Paper and Papermaking* that no paper manufacturer in America need ever go bankrupt.

to function successfully, and here small local concerns drawing on neighborhood labor still predominated.

The War Between the States, like every great conflict, was to bring many changes, a speeding up of production, an intensification of effort. Industrialization in much of the North and in sections of the settled West was an accomplished fact in 1861, but an industrial society had not as yet arisen. Agriculture or commercial undertakings still supplemented factory employment in many communities. In the cotton-textile industry alone were there evidences of conditions that were later to become general. Machines, and therefore factories in which to run them by water or steam power, existed in every branch of manufacturing in the *ante-bellum* period. But great concentrations of wealth, a conscious proletariat, elaborate marketing schemes, and all that an industrial society spells to the modern world, had not yet come into being.

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CHAPTER 13

Money and Commercial Banking, 1789-1861

The Role of Banking in Facilitating Production and Exchange

ANY ECONOMIC SOCIETY that has developed beyond the most rudimentary stages has need for a money and credit system that will perform certain functions, the most important of which are to provide a medium of exchange, to supply a measure of value, and to arrange a standard of deferred payments. These requirements arise out of the fundamental nature of exchange and of production spread over time. Unless goods and services are bartered directly for one another, some way must be found to measure the values of the various items that are exchanged. Furthermore, each transaction will give rise to a debit and a credit; thus, the seller will have a claim against the buyer, while conversely the buyer will owe a debt to the seller. It becomes necessary to provide a method whereby these debts can be legally paid off, either at once or at some future time. These functions may be performed by the use of a money substance, for example, by gold or silver. Values may then be expressed in terms of a money unit containing a fixed metallic content. By payment of the appropriate number of such units immediately upon the receipt of goods or services, debts can be extinguished at once, or money can be used as the basis for settlement in the future.

There are, however, alternative ways of accomplishing the same results. As most buyers of goods and services later become sellers, and as sellers in turn become buyers, it is possible to arrange a system whereby debits and credits are offset against each other. In this way exchanges can take place with little or no use of money. It is still necessary, of course, to provide some way of measuring values. If a money substance is in use, a fixed quantity of that substance can be employed to supply the unit for such measurement, although it is possible to provide a unit of value by the adoption of some conventional or arbitrary unit called *money of account*, which may not circulate, but which can nevertheless be used to measure prices, debts, and credits.

Cancellation of debts may be arranged by a periodic meeting together of the parties concerned. If, however, more than a few persons are involved, or if they are scattered geographically, this method may be impractical. More commonly the job is assumed by some person (or

institution), called a *banker*, who specializes in the handling of debts and credits and who undertakes to keep the necessary accounts and make the proper entries.

Bankers, however, do not ordinarily confine their services to book-keeping: they usually take a more active part in the working of the credit system. Normally, persons with credit (or money) which they do not themselves wish to use or lend, place their surplus funds in the hands of a banker for investment. In this instance the banker acts as a financial middleman between the lender and the borrower, and as a specialist in financial matters his judgment in respect to investment is likely to be superior to that of others. But even more important than this advisory function performed by bankers is that of creating *new* purchasing power. Consider, for example, the situation of a manufacturer who wishes to purchase materials and employ workers. He may offer his personal credit in payment for material and labor; but, unless he is very well known, the sellers of materials and the laborers will find it difficult if not impossible to use this personal credit of the manufacturer to pay for the things which they wish. By getting a banker to certify or accept his credit (through a loan), the manufacturer can obtain means of payment (in the form of a bank deposit or bank notes) that will ordinarily be quite satisfactory to his employees and to those from whom he wishes to purchase. In this way, the bank, by lending its own credit, may expand the community's effective supply of circulating media greatly in excess of the amount of any sums initially placed at its disposal. When the manufacturer sells his products, he will receive money or an equivalent asset from someone else that he may use to extinguish his liability to the bank. By performing similar service for other members of the community, in supplying convenient means with which exchanges can be made and debts be paid, the bank becomes a most important contributor to the effective operation of the process of producing and distributing goods and services.

The importance that a well-organized money and credit system has for the effective operation of economic activity can hardly be exaggerated. In a community with little or no money and without any means of clearing debts and credits, exchanges must be carried on by the crude expedient of barter. Many projects that are individually and socially desirable will be difficult if not impossible to undertake. The introduction of money or the establishment of banking facilities in these circumstances will act to release the potential forces that make for economic expansion.

A monetary and credit system is, of course, no guarantee of economic prosperity; badly conceived or managed, it may bring serious evils of its own creation. This is so because the essence of banking lies in the extension of credit to those who seem to be able to repay. Mistakes in

judgment will not only endanger the solvency of the bank, but will result in the promotion of ill-conceived and economically wasteful ventures as well. Arbitrary changes in the volume of money and credit may bring about a serious breakdown of the economy, either through the disorders associated with sharp price inflation or the stagnation that may accompany deflationary policies.

American monetary and banking experiences during the 70-odd years before 1861 amply reveal the difficulties encountered in attempting to establish a satisfactory exchange and credit system. The obstacles and handicaps to overcome were numerous. The nature and functions of money and of banks were but dimly understood by most contemporaries; financial institutions designed for commercial centers were not easily adapted to agrarian needs; while further complications were introduced by controversies over the objectives of monetary and banking policies. Arguments arose concerning the relative merits of "cheap" versus "sound" money, and of central banking as opposed to local banking, all these things reflecting deep-rooted differences between various areas and among groups within those regions. While some of the issues raised during this period were permanently settled, others were only temporarily compromised and were the source of bitter dissension in later years.

Discussion of our monetary and banking history during these years may be considered most conveniently under three headings. First was the problem of replacing the Colonial monetary system with a new standard. This raised questions concerning the choice of metals for coinage, the fixing of a unit of account, the establishment of a mint, and the like. Second, much attention was given, especially within the states, to forming commercial banks. Of particular importance were matters connected with their promotion, their sources of capital, their functions in respect to note issues, provision of credit, clearing, and their contributions to the operations of the economy. Finally, there were centralized banking functions, and here the operations of the two national banks warrant the greatest attention.

The Establishment of a Monetary Standard

Among the important tasks undertaken by the First Congress was the establishment of a national coinage system. Under the Constitution, the Federal Government was given the exclusive right "to coin money, regulate the value thereof, and of foreign coins." There was a need for uniformity, especially since the current monetary system was a hodge-podge. The customary money of account¹ was

¹ The original use of English money arose, of course, from the fact that most of the Colonists came from Great Britain and traded almost exclusively with the mother country and with one another. The development of an adverse balance of payments

British, but the circulating media consisted largely of other foreign coins of various types (principally Spanish), mostly clipped or worn, together with some bank notes and various kinds of paper money issued by individual Colonies and by the Continental Congress.

In the third of his famous reports to Congress, Alexander Hamilton early in 1791 recommended the establishment of a mint and a national coinage system. Under his plan, which was designed to disturb existing conditions as little as possible, the official unit of account was to be the dollar, with both silver and gold acceptable for coinage into "lawful money." The metallic content of the dollar was fixed at 371.25 grains of silver (the average weight of silver in the Spanish milled dollars currently in circulation). Gold was to be coined at a ratio of 1 to 15, which was about the prevailing market ratio.

Congress accepted Hamilton's recommendations with only minor variations. The mint was established in 1791, and a year later legislation was passed which implemented his suggestions concerning the coinage system. Under the new law, gold eagles (\$10), half eagles (\$5) and quarter eagles (\$2.50) were coined in addition to silver dollars and subsidiary coins. Foreign coins were given legal-tender status for a period of years, after which it was presumed that domestic coins could effectively supplant them.²

In view of the bitter controversy which later developed over the merits of bimetallism, it is noteworthy that the First Congress was largely unconcerned by either the ratio or the choice of metals. Hamilton had earlier indicated a preference for gold, but finally recommended the dual standard, because "to annul the use of either of the metals as money is to abridge the quantity of circulating medium, and is liable to all the objections which arise from a comparison of the benefits of a full with the evils of a scanty circulation."³ This opinion apparently was accepted by most members of Congress. But a fierce debate arose over the question of whether the coins should be stamped with a figure of the head of the Goddess of Liberty or the incumbent president.

The expectation that American coins would soon supplant the foreign money in circulation was not realized for three reasons. The adverse trade balance with Great Britain which had characterized the pre-

with England, however, caused a scarcity of British coins in the Colonies and a substitution of a variety of other kinds of money. The lack of unity among the Colonial monetary systems and the continued importance of trade with Britain made it convenient to keep accounts in pounds, shillings, and pence, even though this kind of money was rarely seen. An examination of store records for a number of Connecticut merchants shows that in this area, at least, British units were still being used for accounting purposes as late as 1816.

² The Spanish dollar and its subdivisions continued to have legal-tender qualities until 1857.

³ *The Works of Alexander Hamilton* (editor, H. C. Lodge), Vol. IV, p. 16. New York: G. P. Putnam's Sons, 1904.

Revolutionary period reappeared after the cessation of hostilities. British goods were still prized in American markets; and trade relations, which had been based largely upon personal contacts, were not seriously damaged by the war. Merchandise imports reassumed much of their former importance, and gold and silver again tended to flow out of the United States as payment for the excess of the value of imports over export items.

In the second place, during two periods of monetary disorder, all specie tended to disappear from circulation. Between 1811 and 1816, the Government was in a somewhat precarious financial position owing to the exigencies of war; prices were high, and silver and gold either made their way into domestic hoards or were sent abroad. Suspension of specie payments by many of the banks in 1814 accentuated these movements. Again in the later 1830's an inflationary price level, plus a second suspension of specie payments by the banks, caused a disappearance of metallic coins from circulation.

A third difficulty arose in connection with the mint ratio. While the ratio of 15 to 1 adopted in 1792 reflected the current market ratio between silver and gold, the commercial value of gold gradually began to increase. As a result much less gold was brought to the mint than had been anticipated. Meanwhile the fairly large number of silver dollars were disappearing from circulation almost as fast as they were issued. These bright, new coins found a ready acceptance in the West Indies, where they could be exchanged for duller but slightly heavier Spanish or Mexican coins. The latter could be turned in at the American mint at a profit of about one per cent. This process was stopped in 1806 by President Jefferson when he suspended the coinage of silver dollars. The duties of the mint were thereby reduced to the coinage of small amounts of gold and subsidiary coins. Nothing further was done to remedy the situation in respect to coinage for some 28 years. Meanwhile the country continued to depend upon miscellaneous foreign coins for its specie circulation.

Under legislation passed by Congress in 1834 and slightly amended three years later, the mint ratio was changed to 16 to 1 by reducing the weight of the gold dollar. This move reflected a desire to bring gold back into circulation, and was prompted in part by a wish to increase the value of gold from mines recently discovered in North Carolina and Georgia. Under the new mint ratio, gold was now slightly overvalued at the mint, while silver was more valuable in the market. As has already been noted, few silver dollars were in circulation; but now, as an unexpected result of the changed ratio, subsidiary silver coins which had been coined since 1792 with proportionate amounts of metal (two fifty-cent pieces, for example, weighed as much as a silver dollar) began to disappear from circulation, being supplanted by abraded

foreign coins. This new problem was finally solved in 1853 when the weight of subsidiary coins was reduced. This arrangement made it unprofitable either to export subsidiary coins or to melt them down for industrial purposes.

The general situation in respect to specie circulation began to improve during the early 1840's. Although the trade balance was still adverse, an increasing flow of foreign investments into the United States made it possible to keep gold in circulation, and this metal began to flow into the mint in increasing quantities. With the gold discoveries of 1849, the problem of a specie standard was settled for the remainder of the period before the War Between the States.

Some of the principal difficulties connected with establishing a monetary system had thus been solved by 1861. The dollar, with its convenient subdivisions, was established as the monetary standard. To be sure, little success had been achieved in keeping a bimetallic standard in operation. The country operated upon a *de facto* silver standard (using foreign coins) until the change in the mint ratio in 1834, together with the increasing supplies of gold, caused a shift toward a monometallic gold basis. The fact that the legal status of silver remained unchanged was, of course, to lead to much controversy at a later date.

One further point should be noted. Congress made a tentative gesture toward issuing paper money in connection with the War of 1812. Between 1812 and 1816 something over \$36,000,000 of Treasury notes were issued by the Government in payment for needed war supplies and services. Only about \$4,000,000 of these, however, were of denominations less than \$100, and consequently the issues had only a limited general circulation. Furthermore, none had full legal-tender qualities, and they were promptly redeemed after 1815. There is some reason to believe that if the war had lasted longer, subsequent issues of these notes would have acquired further characteristics of government paper money. Actually, however, the events were but a foreshadowing of the later experiments with greenbacks.

Banking Development

The setting

American banking development between 1789 and 1861 revealed many of the basic differences existing between sections and between economic classes. Opposing interests were often closely matched in economic and political strength, and this fact made the controversies all the more vigorous and the results uncertain. Agitation for cheap money, which had been given little expression in the establishment of a national currency, found its outlet in the banking field; meantime a fear of a centralized money monopoly became widespread and persistent. The

fact that banking privileges could be granted by the states as well as by the Federal Government made possible a variety of experiments and was still another influence that added greatly to the complexities of the banking structure.

These controversies over the proper functions and scope of banking institutions had their roots in certain features of the general economic setting. This was especially true of the demands for cheap money. Support for such a policy arose basically out of the fact that the country was new and growing rapidly. Population was increasing by over one-third every ten years, and new areas and resources were fast coming into use. There was a continuing desire for capital and a real need for institutions that could mobilize the savings of the community. The possibilities of securing a competence, if not a fortune, engendered a speculative spirit that prompted large numbers of the people to go into debt on a scale that made their financial position precarious in times of economic adversity.

In agriculture the situation was probably the most critical. This branch of the economy occupied by far the largest percentage of the population, and the desire for capital funds to purchase land, stock, and equipment was almost insatiable. It was in the field of agricultural credit that the capital markets were most poorly organized. Commercial houses, in contrast, could not only secure credit from commercial banks, but customarily had foreign connections, especially with English firms, that made borrowing relatively easy. Transportation and industrial ventures were able to call increasingly upon both foreign and domestic sources of investment funds. The farmers, however, found it difficult to borrow for their intermediate and long-term capital needs from banks that were lending on short-term business and commercial paper. Nor could the agriculturists offer the kind of securities that would appeal to the purchasers of stocks and bonds.

Many people saw a close connection between large supplies of money and abundant capital. As a result, a substantial part of the population was quick to resist any attempts that would introduce deflationary elements into the monetary system. To these groups a reduction in the supply of money would bring stabilization or a fall of the price level, which in turn would threaten not only increased debt burdens but a reduced supply of capital funds as well.

Banks apparently offered an easy solution to these various needs and desires. They could issue notes that would add to the circulating media of the country and at the same time contribute materially to the supply of loanable funds. Popular opinion on these matters had no small merit. As has already been noted, banks can be important energizing agencies, especially in communities with little money or without credit facilities. So many American areas approached this descrip-

tion, especially in their earlier history, that probably the introduction of banks made an unusually important contribution to our growth and expansion. Admittedly, ignorance and inexperience led to many unfortunate experiments; but, as one of the pioneer writers on this subject has pointed out, "It is well . . . to remember that while there were undoubted losses from the imperfections inherent in the diverse banking systems well-nigh inseparable from the primitive conditions of those times, the State banks existing before the Civil War were, nevertheless, of great benefit to the commerce and industries of the country. The 'red dog' and 'wildcat' currency of these banks is generally held up as an example of the impropriety of permitting banks to issue notes, but the banks which redeemed their notes, even after the government suspended specie payments, seem to have been forgotten."⁴

Unincorporated banking

It would be a mistake to date the beginning of banking operations with the establishment of formally organized institutions. Many communities possessed important banking facilities prior to the introduction of incorporated banks.⁵ Commonly these functions were performed by local merchants or storekeepers, who sold goods on a fairly long-term credit basis and accepted in payment the goods and services of their customers. By keeping open accounts for long periods of time, extending in many cases to several years, they greatly economized the use of cash. Furthermore, the merchants contributed to clearing operations within the communities by accepting promissory notes drawn between their customers and by transferring debits and credits on their books. Not infrequently storekeepers combined these services with savings bank or investment banking functions. This was done by lending the proprietor's own capital, and by borrowing and relending surplus funds from other members of the community.⁶

How important this type of country store may have been for American development is impossible to determine, but there is reason to think that it was not uncommon, especially in the earlier stages of our economic development. One of the principal handicaps under which these "cracker-barrel" bankers operated, however, was the limited area within which their credit was acceptable. By contrast, the privilege of note issue enabled incorporated institutions to circulate their credit much more widely. This feature, coupled with limited liability of in-

⁴ John Jay Knox, *A History of Banking in the United States*, pp. 305-306. New York: Bradford Rhodes & Company, 1900.

⁵ Investment banking, which was largely conducted by individuals and partnerships, is discussed below in Chapter 14.

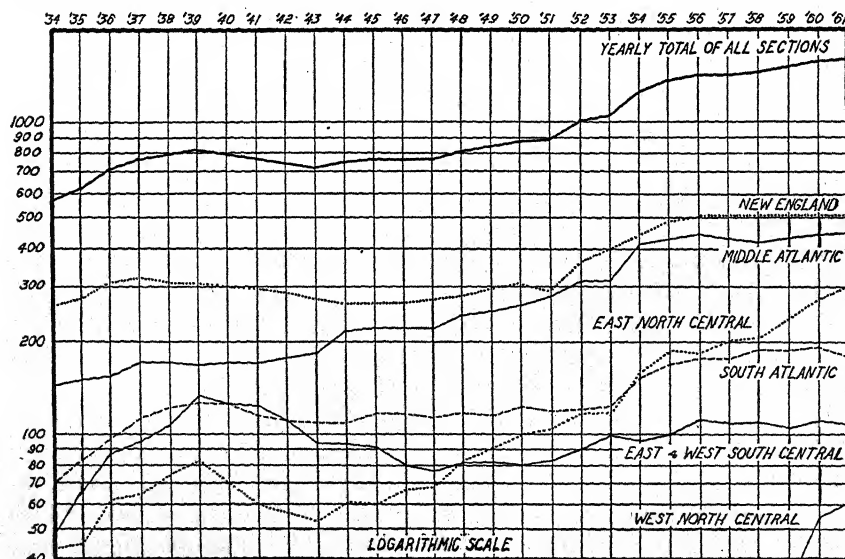
⁶ The foregoing information has been gathered from an examination of a number of account books of Connecticut and Massachusetts stores operating in the later eighteenth and early nineteenth centuries.

vestors, gave the incorporated banks a considerable advantage over the unincorporated type. As a result, the chartered banks played a much more important part in American economic development.

Growth of state-incorporated banks

The country began its national existence with but three chartered banks. The number grew slowly in the succeeding two decades, and not until 1802 were there banking facilities in all of the Seaboard States. Only after that date did they begin to appear in the hinterland. The best estimate puts the total number at 88 in 1811. The failure in that year to recharter the First Bank of the United States⁷ was the occasion for a sharp increase, nearly 250 banks being reported in 1816, when the Second Bank of the United States went into operation. Expansion was again slow down to 1830, reaching an estimated figure of 330 at that date.

An impression of the growth and distribution of banks for the period 1834-1861 is given in the following chart. The record is one of rapid



Number of State Banks: 1834-1861. (Classification by areas follows the census.)
Source of basic data: Report of the Comptroller of the Currency, 1876.

increase in totals up to 1839; then follows a decline for approximately four years, after which there is an almost uninterrupted expansion until 1861. The initial growth following 1834 was closely associated with the failure to recharter the Second Bank of the United States.⁸

⁷ See below, p. 274.

⁸ See below, p. 278.

The decline between 1839 and 1843 was due principally to the panic of 1837 and the subsequent period of depression. After 1843 the increase reflected not only the general expansion that was occurring in the American economy, but a somewhat more lenient legislative attitude toward the granting of charters as well. Prior to the late 1830's, bank charters were granted only by special acts of the state legislatures. This system tended to limit the number of banking institutions and was subject to considerable abuse. In many cases charter privileges became prizes to be handed out to the supporters of the political party in power or in return for compensation of various kinds. New York took the lead in changing this system in 1838 by enacting legislation that permitted the formation of a bank by any group that could meet the requirements set forth in the law. Known as the "free banking act," this measure was copied by a number of other states.⁹

The regional pattern shows some variations from the general picture. It will be noted that the decline in the number of banks was most severe following 1839 in the East North Central and the East and West South Central areas. In the former section the "wildcat"¹⁰ type of banks had been particularly prevalent during the 1830's, and the inherent weaknesses in their structure and operation were exposed by the crisis and depression. Government-sponsored and -operated banks had been popular in several Southern states. A combination of ignorance of banking principles and political pressure had led in many cases to extensive loans by these institutions to communities for grandiose schemes of public works and to favored customers for projects of doubtful economic worth. These faults were also exposed by the depression following 1837. Only in the East and the West South Central area did the number of banks fail to follow the trend of growth shown in other regions after 1843. To some extent the figures are misleading. In Louisiana, for example, banking after 1842 was concentrated in a few large banks with branches, and it is doubtful if actual banking facilities were greatly reduced. On the other hand, there was some tendency in other Southern states to reduce the number of banks after the experiences following 1837.

Some further indication of the growth of banking facilities by regions can be obtained from Table 1. Except for the Middle Atlantic region,

⁹ The enthusiasm for banks, however, was by no means universal. Experiences, especially during the panic and depression following 1837, led to a strong anti-bank feeling in several regions. In some states the legislatures refused to renew the charters of existing institutions or to authorize new banks; and in one or two cases, state constitutions explicitly prohibited the establishment of banks. According to Sumner, "In 1852, there were no banks in Florida, Texas, Arkansas, Illinois, Wisconsin, Iowa, Minnesota, Oregon, California, and the District of Columbia." William Graham Sumner, *A History of Banking in the United States*, p. 415. New York: The Journal of Commerce and Commercial Bulletin, 1896.

¹⁰ See below, p. 261.

TABLE 1
ESTIMATED POPULATION PER BANK
(In thousands)

<i>Year</i>	<i>New England</i>	<i>Middle Atlantic</i>	<i>East North Central</i>	<i>South Atlantic</i>	<i>East and West South Central</i>	<i>West North Central</i>
1840....	7.4	26.0	42.0	24.0	22.0	...
1850....	8.8	23.5	45.0	37.0	54.0	...
1860....	6.3	17.0	25.0	28.0	48.0	35.0

Source of basic data: Report of Comptroller of the Currency, 1876; *Statistical Abstract of the United States*, 1938.

Note. The classifications by areas follow those used by the census.

it will be noticed that population increased more rapidly than did the number of banks between 1830 and 1850, but that banks again grew faster than population in the following decade. In the Southern states, especially in the Deep South, there were fewer banks for a given number of persons in 1860 than there had been 20 years before. By contrast, the Northern sections all show sharply increased facilities per capita for the same period. Most striking is the relatively large number of banks in New England in comparison to the population. This condition reflects the extent to which New England had developed transportation, commerce, and manufacturing during the years under consideration. These activities not only stimulated a desire for banking facilities, but, coupled with "Yankee thrift," furnished funds for their establishment.

Bank promotion

The initial steps in the promotion of banks during the period before 1861 were undertaken either by individuals, by states, or by some combination of the two. The majority of banks probably owed their organization to groups of individuals, but a considerable number were formed and managed by the states, in addition to many that were jointly financed and directed. The privately promoted institutions were established generally in the Eastern and more settled areas, while the state-sponsored banks were located in the South and West. The privilege of investment and partial control by the states was fairly common, although the rights were not always exercised.

Success or failure of the banks apparently had little to do with the form of their original promotion. The state-operated banks of Kentucky, Illinois, Tennessee, Florida, Mississippi, and Alabama were on the whole dismal failures, whereas Ohio and Indiana could boast of well-run and successful systems. The mixed form and the privately organized institutions showed similar variations. The need for banking facilities and the general intelligence with which they operated ap-

parently had more to do with their success than did their institutional form.¹¹

The specific motives for establishing banks varied considerably. The state-operated systems usually received their support on the grounds that they would make important contributions to general welfare.¹² Not infrequently a need for a special type of credit, particularly for agriculture, was an important factor in their promotion. Individuals were attracted to banking for a variety of reasons. To some the opportunities for speculation or for fraud had special appeal. General ignorance of banking procedures, coupled with laxity in the enforcement of laws, gave rise to a number of amusing and sometimes tragic episodes; the term "wildcat" banking, for example, arose from the practice of locating redemption offices in inaccessible spots such as the depth of a forest where there were few human habitations "but plenty of wildcats." Promoters of such ventures had no thought of conducting a regular banking institution; their actions were little more defensible than those of counterfeiters. The failure of these schemes fell most heavily upon the innocent and gullible who were left holding worthless notes.¹³ While each area had its own experiences of this sort, their importance should not be exaggerated, since quantitatively they probably were not of great significance.

The investment opportunities offered by banks made an appeal to a sizable number of persons. How profitable banking actually was during this period is not known, but it seems clear that bank stock stood high among investment outlets. The faith in the soundness of such investments is shown by the provision by some states that religious and educational groups be allowed to subscribe to a certain portion of the securities of newly established banks.¹⁴

¹¹ A similar observation may be made concerning legal restrictions. Knox points out that "A banking system succeeded well in Louisiana under almost identical laws with those of banking systems in Alabama, Mississippi, and Florida, which were most ridiculous failures. The banking laws of Michigan were very similar to those of New York, but the banks in the latter state were generally successful while those of Michigan became a by-word and a hissing." John Jay Knox, *History of Banking in the United States*, p. 314.

¹² Thus, the preamble of the charter of the Bank of the State of Alabama stated that the object of its establishment was "to provide for a safe and profitable investment of the funds of the State and to secure an extended and undepreciating currency." It might be added that salaries and privileges of the officials of this bank were such that appointments became a part of the political "spoils" system of the state.

¹³ W. G. Sumner, *History of Banking in the United States*, contains numerous examples of fraudulent and highly speculative banking.

¹⁴ The high standing of the stock of an established bank is illustrated by the following names selected from among the list for 1839 of stockholders of the Canal Bank of Portland, Maine: Charity Fund, First Parish; Female Orphan Asylum; Trustees, School Fund North Yarmouth; Trustees, Portland Academy; Lodge Charity Fund; Trustees, Ministerial Fund; Mutual Fire Insurance Company, Saco; Institution for Savings for Portland and Vicinity; Proprietors of Atheneum.

While available evidence is by no means conclusive, it seems probable that the people most active in the promotion and management of the average bank were groups and individuals primarily interested in developing sources of credit. In view of the great demands for capital, it is not astonishing that the possibilities offered by banking institutions should be developed in this manner. In some instances the establishment of a bank merely formalized a practice that had been carried on previously: namely, the pooling of resources, which would be loaned to the various participants. In other cases, the purpose was to secure a preferential position in respect to the funds contributed by others or created by the institution.¹⁵ As a result, several interesting and fundamental questions having to do with the functions and responsibilities of bank officials were raised by contemporaries. The issues became focused upon the propriety of loans to officers and stockholders. Opponents of any but nominal loans to officials insisted that the officers should manage the bank for the benefit of the stockholders. The privilege of doing business under a public charter was stressed, and it was felt that the advantages should be open to the public on a more impersonal basis. On the other hand, there were the obvious difficulties of getting officials who "would inspire the confidence of the community" and at the same time not be logical candidates for large loans. Ordinarily no salaries were paid to members of the boards of directors, and even the presidents usually received only a nominal compensation.

In general, the matter was compromised. Most states eventually put specific limits on the amounts that could be borrowed in this fashion. But evasion was not too difficult,¹⁶ and the situation seemed to be governed by the circumstances affecting the individual bank. Like many other features of American banking during its early history, the practice was not in itself unsound. The danger lay in the excessive or unscrupulous use of the privilege.¹⁷

¹⁵ Even public officials were sensitive to this possibility. Dewey points out that one of the reasons why many bank charters contained the proviso that the State should be permitted to own part of the stock was "... because ownership would place the State in the light of a favored customer when it wished to borrow." Davis R. Dewey, *State Banking Before the Civil War*, p. 33. Washington, D. C.: The National Monetary Commission, 1910.

¹⁶ The Maine Bank Commissioners, for example, commented in their Annual Report for 1849, "The Commissioners have again to regret, that in several of the banks the limitation of the law in relation to the indebtedness of the directors, is very little heeded; and as this is the rock most dangerous to banking institutions, it might be well to mark it by more severe penalties. Who ever knew, or heard of the failure of a banking institution, except through excessive loans to the directors? The public seldom, if ever, suffer from any other cause."

¹⁷ Even the conservative Massachusetts Bank as late as 1860 permitted loans to directors to the amount of \$450,000, or about one-third of the total loans of the Bank at the time. N. S. B. Gras, *The Massachusetts First National Bank of Boston, 1784-1934*, p. 122. Cambridge, Mass.: Harvard University Press, 1937.

Banks often found it difficult, especially in newer areas, to raise capital, as surplus funds that could be used for this purpose were limited. One of the commonest devices used to meet this deficiency involved the use of stock notes. Under this arrangement purchasers of bank stock would make a small "down payment," and the unpaid balance would then be borrowed from the bank on personal notes, with the stock as collateral. In some cases even the "down payment" was omitted, the entire amount being advanced by the bank. The extent to which banks were founded in this way varied considerably. Most institutions started with more or less capital contributed by stockholders, but probably only a small fraction of the banks established during the period before 1861 began operations with their stock fully paid. The practice was clearly open to abuse. In extreme form, it permitted individuals to start banks with no financial risk to themselves. If the venture proved successful, the stock could be paid for out of earnings; if it failed, the incidence was borne by others. But the fact that a great many of the institutions founded during these years continued to operate successfully is evidence that the procedure was not necessarily bad.

Lack of specie presented another difficulty that frequently faced our early banking institutions. Charters commonly provided that a portion of the funds subscribed for bank stock was to be paid in specie. It will be recalled, however, that there was a chronic shortage of specie well down into the 1840's. Resort was made to various schemes that would meet this deficiency. On occasion, specie would be paid in and kept in the vaults long enough to satisfy the legal requirements, after which it would be promptly withdrawn, possibly to serve in a similar capacity for another institution. The bank examiners for Michigan complained at one time that "Gold and silver flew about the country with the celerity of magic; its sound was heard in the depths of the forest, yet like the wind, one knew not whence it came or whither it was going." The examiners soon began to recognize individual coins that would turn up each time they examined a new bank.¹⁸

In some instances specie certificates were acceptable instead of specie. These, too, could be borrowed, for a consideration, by those who wished to start banks, and returned when the ordeal of examination by bank commissioners was safely passed. But these examples of attempts to do banking with little or no specie reserves should not be given undue importance. The accompanying tabulation (Table 2), while based upon incomplete data, shows that, after 1836 at least, the banks had on the average a considerable amount of specie reserves against their liabilities.

¹⁸ John Jay Knox, *History of Banking*, p. 734.

TABLE 2
STATE BANKS' RATIO OF SPECIE HOLDINGS TO DEPOSITS AND CIRCULATION
(Figures are in millions.)

Date	Deposits	Circulation	Total	Specie	Percentage
1836	\$115	\$140	\$255	\$40	17.0
1837	129	149	276	38	13.7
1840	76	107	183	33	18.2
1845	88	90	178	44	24.8
1850	110	131	241	45	18.5
1855	190	187	377	54	14.3
1860	254	207	461	84	18.0

Source of basic data: J. J. Knox, *History of Banking*, p. 312.

Banking operations

The New York Bank Commissioner's Report for 1831 states, "The common operations of banking are receiving deposits for safe keeping, loaning the floating balance of such deposits, borrowing large sums at a reduced rate of interest upon deposits, and employing the average balance in productive investments, loaning capital upon real estate, accommodation, or business paper, purchasing and selling bills of exchange, circulating bank paper as currency upon the credit either of a portion of capital received for redeeming it, or upon the floating balance of deposits."

This list of operations, probably typical of most of the state systems of the time, gives clear evidence of the diverse activities engaged in by the American banks. To be sure, not all banks engaged equally in each of these types of business. Specific institutions tended to reflect their economic environment. This was especially true of banking done in the cities as contrasted with that in the towns or rural districts.

The first banks were established in urban centers, and the three that were operating in 1789 are typical of later banks in the larger cities. These were the Bank of North America, the Bank of New York, and the Bank of Massachusetts, located, respectively, in Philadelphia, New York, and Boston. Doing business in the principal business and commercial cities of the country, these institutions had certain common characteristics. Their establishment represented a response to the growing need for banks that could furnish short-term commercial loans; and to a considerable extent their operations only formalized an earlier practice of pooling resources, which had for some time been carried on by merchants in these cities.¹⁹ They functioned according to the accepted standards of European commercial banks; loans were chiefly on short-term commercial paper and customers were principally merchants and businessmen.

¹⁹ See Bray Hammond's interesting article, "Long and Short Term Credit in Early American Banking," *Quarterly Journal of Economics*, Vol. XLIX (1935).

Banks were not long confined to commercial centers, however. Typical of the conditions leading to the establishment of banks in many other parts of the country is the following description of the situation in western New York State in the late 1830's: "Here was concentrated the demand for new banks, an expression of the need for capital to improve farm lands, to build flour, grist, and saw mills, to buy up real estate for speculating purposes. Cotton, woolen, glass, rope, paper, oilcloth, leather factories, and iron works were being established and required capital accumulation not available to promoters. The aid of banks was enlisted. Even city merchants, whose credit requirements were suited to the interests of commercial banks, began to ask for longer maturities, under the pressure from their country purchases."²⁰

To meet such demands the banks were forced to do a somewhat different kind of business from that carried on by those operating in commercial centers. The principal variation concerned the nature and length of their loans. Much borrowing was done, not for the purpose of financing short-term, self-liquidating projects, but with the object of meeting intermediate or long-term capital needs. Since both bank notes and most bank deposits were payable on demand, the banks were placed in the position of having to pay out of immediate-order funds that were not collectible until a considerable time period had elapsed. Some attempt was usually made to preserve the form of commercial loans by accepting paper repayable within a short term, and then renewing such loans as they came due, actually furnishing long-term capital funds.

The dangers to the banks involved depended upon the circumstances under which they were operating. As long as the loans were sound, the banks could be reasonably certain of repayment. Furthermore, the fact that most loans were taken by customers in the form of bank notes made long-term lending less embarrassing to the banks than might otherwise have been expected, for, in contrast with checks drawn against deposits, bank notes tend to remain in circulation for much longer periods of time. In times of uncertainty, however, when the solvency of particular institutions or of the banks as a whole was questioned, banks that had made long-term loans were especially vulnerable (although their loans were not necessarily inherently unsound) and were likely to be thrown into bankruptcy as depositors or holders of their notes presented their claims for redemption into cash.

Security of note issues

Almost without exception the states, through the provisions in individual bank charters or in their general banking laws, made some at-

²⁰ This quotation is from an unpublished manuscript by Anna Jacobsen, *Commercial Banking in New York Before 1863*, p. 17.

tempt to protect the holders of bank notes. The plans varied a great deal as different areas attempted to work out satisfactory solutions. Among the many schemes that were tried a few, however, deserve special mention because of their importance for later American banking policies or because of their fairly widespread use before 1861. Because notes rather than deposits continued to be the most important item in bank liabilities until well after the middle of the nineteenth century, legislative interest centered primarily on the protection of all persons who received bank notes in the ordinary course of business.

One plan allowed banks to issue notes against general assets, usually according to some ratio between the volume of notes and the amount of the bank's capital. This plan was especially important in New England, where, in conjunction with the Suffolk System,²¹ it worked quite successfully, under the supervision of state bank commissions and because it was aided by a comparatively conservative economic environment.

Meantime New York, in 1829, had put in its Safety Fund System, which called for a total contribution of three per cent of the capital of the participating banks to form a protective fund administered by the State Treasurer. As originally passed, the Safety Fund was designed to protect both depositors and noteholders of failed banks. The State Treasurer was therefore authorized to dip into the safety fund to make up any deficit that remained after the assets of an insolvent bank had been liquidated. As it turned out, before all the payments to the creditors of failed banks between 1840 and 1842 could be made, the "safety fund" was exhausted, and the State of New York was forced to advance enough funds to make up the deficiency. As a result, the law was changed in 1842 to provide protection only for noteholders.²² Later safety fund contributions by the banks repaid the State for its advances. In principle the safety fund had much to recommend it as a device for the protection of the public against bank failures: it was an early version of our present guarantee of bank liabilities.²³ The system, however, was not popular outside New York, owing in part at least to the difficulties that that state experienced with the administration of the safety fund.

The first statutory emphasis upon reserves as a way of insuring the quality of deposits and notes occurred in Louisiana. By legislation

²¹ See below, p. 269.

²² The logic of this provision lay in the fact that noteholders, unlike depositors, usually had little choice whether they would accept bank notes offered in payment. This was especially true of the more uninformed members of the community.

²³ Canada adopted a similar system in 1890, which has operated quite successfully. The Federal Deposit Insurance Corporation established by Congress in 1935 also follows this principle in respect to bank deposits.

passed in 1842, the banks of the state were required to operate under the following principal provisions: at least one-third of each bank's deposits and circulation had to be backed by specie, with the rest protected by short-term, non-renewable commercial paper. Renewal of paper at maturity was forbidden, and anyone who requested such a renewal was to have his account closed and his name sent to all the banks as delinquent. Finally, a statement of the condition of the banks in New Orleans had to be published weekly.

Strictly enforced, these provisions carried the Louisiana banks through business crises in the forties and fifties and allowed them to weather the outbreak of the war in 1861 without suspension. In many respects, however, the situation in Louisiana was unique. Five institutions with central offices in New Orleans and with branches throughout the state did all the banking for the state. At that time, New Orleans was one of the world's most important commercial centers and the chief market through which gold and silver from Mexico made their way into the United States. These conditions contributed to the system's success, and obviously were not the typical circumstances that characterized most American areas. While the plan was subsequently followed in part by New York and Massachusetts, it found little acceptance elsewhere.

New York's free banking system provided the most popular but by no means the most effective plan for safeguarding the issue of bank notes. This legislation, it will be recalled, was passed in 1838, and permitted any person or group of persons to start a bank provided the stipulations of the law were met. Under the act, no bank could circulate notes until it had first deposited approved securities equivalent in value to 100 per cent of the note issues with the comptroller of the state. In case of default by any bank, the securities thus deposited were to be sold and the proceeds applied to the redemption of the notes.

The New York law was widely copied; indeed, some 16 states eventually adopted similar legislation. Nor are the causes for the popularity of free banking hard to explain: free banking fitted in well with the generally accepted doctrine of equal rights; security-backed bank notes promised to provide abundant circulation; and banks could collect interest from the securities that they had deposited as well as from lending their notes. From the standpoint of banking operations, however, the system had a serious limitation. Banks could be established with little or no regard for the existing credit needs of the communities in which they were located. Any person or group of persons, no matter how inexperienced they might be in financial matters, could start a bank. As a result, many institutions originally formed under this type of legislation were organized chiefly for the purpose of issuing currency,

with little or no thought given to the proper functions of banking.²⁴ Without care in making loans, many of these banks were soon forced to default on their notes, and it was then discovered that the securities pledged were often as worthless as the claims issued against them. It was only when the laws were modified and when state officials became more careful in their administering, and the banks on their part recognized the necessity of doing a banking business, that the security-backed bank note system began to operate more effectively.

Interbank Relationships and Centralized Banking

Once established, American banks tended rather quickly to develop certain interbank relations. These connections took a number of forms and in their more advanced stages involved a centralization of those functions that concerned the operation of the banking system as a whole.

Development of clearing

Clearing of accounts was one of the first interbank relations to develop. This operation began on an informal basis, with each bank in a town or city sending its claims by messenger to all the other banks. Settlements of balances were customarily made by the payment of cash on a daily or weekly basis. The scheme greatly economized on the use of specie, since the balances to be paid ordinarily amounted to only a small fraction of the total liabilities to other banks. With an increase in the number of participants, the use of messengers grew more complex and wasteful of time. As a result, several formal clearing house associations were formed in the principal financial centers. New York led the way with the establishment of its association in 1853, and was followed by Boston in 1856 and Philadelphia in 1858.

Clearing between communities was accomplished by the development of correspondent relations. The primary purpose of such an arrangement was to avoid the expense of sending out-of-town checks and notes directly to each of the banks at which they were payable. A simpler way to handle this problem was to arrange with some centrally located bank to accept these items and provide for their collection. Hence it

²⁴ The following description illustrates how a number of "banks" were established under the free banking act adopted by Indiana in 1853. "A thousand or two dollars in cash was all that was required to start a bank. This was needed to pay for engraving the plates and printing the bills. An embryo banker would go to New York with a thousand dollars, order an engraver to make the plates, and print \$50,000 in bills. He would next visit a broker and negotiate for \$50,000 of the bonds of some State, get them at a discount, and instruct the broker to send them to Indianapolis in care of the Auditor of State, the price to be paid on their delivery at Indianapolis. He would then go to Indianapolis with his \$50,000 of new bills, get the Auditor to countersign them, and pay for the bonds with the bills and have a surplus left. *Thus a new bank would be established, without banking-house, furniture or anything else.*" John Jay Knox, *History of Banking*, p. 702.

presently became the practice for country banks to maintain balances with correspondent banks in the chief commercial and business centers, and to allow the correspondent bank to use these funds as compensation for the expense involved in clearing interbank accounts of the country banks participating in the plan. The services of the city institutions were not confined to the handling of collection items. Country banks were able to call upon their urban correspondents for a number of important financial services. Thus the city banks acted as agents in investing country-bank funds in security markets, they furnished information regarding credit ratings of firms and individuals, and they gave advice regarding future business trends.

The Suffolk System

The most noteworthy clearing arrangement that operated during the period before 1863 was the Suffolk System. Its establishment grew out of a situation in respect to bank note circulation that had developed in Boston as early as 1800. With the growth of commerce and industry in New England, Boston, as the chief financial and commercial center, began to attract an increasing amount of the bank note circulation from the entire area. Bank notes from outlying towns arrived in Boston partly because many purchases made by businessmen in other parts of New England were payable in Boston, and, in addition, the opportunities for buying commercial paper and loaning money in other ways prompted many banks outside Boston to maintain lending agents in that city. In this way funds that could not be used with profit locally, found an urban investment outlet.

These "country-bank" notes tended to circulate in Boston at a discount ranging up to five per cent, depending upon the difficulty of sending them home for redemption. The notes of the Boston banks, by contrast, circulated at par. As a result, the Boston banks found that their own notes tended to return rather quickly while those of outside institutions remained in circulation. In 1818 the Boston banks, having more than half the banking capital in New England, estimated that their circulation amounted to about four per cent of the total. After several preliminary attempts had been made to remedy the situation, effective action really began with the establishment of the Suffolk System in 1824. Prior to that date both the New England Bank and the Suffolk Bank had collected country notes and had presented them for redemption at the issuing institutions. The result was a reduction but not an elimination of the discount on country notes. In 1824 the Suffolk Bank proposed to expand and strengthen these arrangements by entering into an agreement with the other Boston banks to act as their agent in the handling of any non-Boston notes that the Boston banks might receive. The proposition had considerable appeal, and the result was that six

Boston banks joined with the Suffolk Bank, and the system was put into operation.

Arrangements were then worked out between the Suffolk Bank and the country banks: the notes of the latter would be received at par if, in addition to a sum sufficient to redeem their notes, each participating bank would maintain a permanent deposit with the Suffolk Bank.²⁵ The notes of any bank that did not come into the system were gathered by the Suffolk Bank and sent home for specie redemption, thus threatening the solvency of nonparticipating banks.

Most of the New England banks eventually came into the Suffolk System, although not without a considerable amount of complaint. Popular phraseology termed the system the "Holy Alliance" or "the Six-Tailed Bashaw." The most violent objections came from those institutions whose loans exceeded conservative limits and which circulated their notes over a wide geographic area in the expectation that few would ever be presented for redemption. Some appreciation of the position occupied by the system in the New England banking structure can be obtained from the fact that its annual clearings in the middle 1850's amounted to some \$400,000,000, or about ten times the average circulation of the participating banks.

The most important accomplishment of the Suffolk System was the elimination of the discount on bank notes. Even outside the New England area the notes of the banks allied with the Suffolk Bank were readily accepted for payment. Not only did the public gain from the circulation of bank notes at par, but most of the banks profited also through an improved credit standing. The operation of the system, furthermore, reduced the circulation of specie. Member banks were kept in a position of being able to pay out metallic money promptly on demand; consequently, there were rather few such requests and specie remained in the banks as reserves.

In view of the original purpose for which the system was established, it should be pointed out that the circulation of the Boston banks was not greatly increased by its operation, probably because in a commercial center bank the use of checks against deposits is more convenient than bank notes. It is an interesting example of an institution that failed in its initial objective but which rendered valuable services in other ways.

Actually the Suffolk System exercised certain functions commonly associated with central banking. In addition to centralization of clearing, there was some concentration of banking reserves with the Suffolk Bank. Subject to certain restrictions, the Bank also allowed its members the privilege of drawing overdrafts in case their balances should be

²⁵ By lending these deposits, the Suffolk Bank would receive an income that could be used to pay expenses of operation.

deficient. Furthermore, by refusing to accept banks as members of the system until they had met certain qualifications of character and good faith, or by dropping institutions from its rolls, the Suffolk System exercised a considerable amount of qualitative control over banking operations in New England. To be on the list of institutions whose notes were not receivable by the Suffolk Bank was regarded with great seriousness.

But as a central bank, the system never developed beyond the embryonic stages. Primarily a great clearing house, it kept note issues equalized among its members, so that one bank could not expand its loans at a faster rate than others in the system. But the Suffolk System did not attempt to control the total volume of loans and note issues: "The public was not insured against a general collapse of the banking system, although it was protected against large losses resulting from the excesses of individual banks."²⁶

Centralization of reserves

As was noted above, the development of correspondent relations between banks tended to concentrate funds in the principal commercial and industrial centers. This trend was accentuated as country banks began lending their surplus funds to city institutions. The incentive for such loans arose chiefly from several circumstances. In the first place, much of the business done by country banks was seasonal in nature, a fact that left them periodically with idle funds; hence, investment in the metropolitan areas was one way of increasing earnings in off seasons. Second, many banks had a lending capacity that exceeded local demands at current or customary rates, a situation that also resulted in urban lending.²⁷ Finally, as many payments made by banks for their customers were payable in centers like Boston, New York, Baltimore, and Philadelphia, it was convenient to maintain balances in those cities for such purposes. Banks in the commercial centers, on the other hand, had sufficient opportunity for relending to make it worth while to pay interest on these deposits.

This trend toward centralization of funds had important implications for the American banking structure as a whole. Country banks began to treat their deposits with the city banks as the equivalent of reserves in their own vaults. In case of emergency they expected that such deposits could be quickly withdrawn.²⁸ By 1850 such concentration had

²⁶ This quotation is taken from an unpublished manuscript by Wilfred S. Lake, *The History of Banking Regulation in Massachusetts*, p. 241.

²⁷ In some instances state laws set maximum rates of interest that were below what could be obtained in unregulated markets.

²⁸ In 1852, for example, the Bank Commissioners of Vermont, in explaining the relatively small amount of specie reserve held by the banks in that state, accused their critics of overlooking the fact that "our deposits remaining in the city banks,

reached important proportions. One difficulty resulting from this arrangement was that banks in the urban centers, especially New York, held the main banking reserves of the country without having accepted the responsibility which that concentration implied.²⁹ If these reserves were to serve the purpose of meeting an emergency, there had to be skillful and united action by the holders, but this task the urban institutions were unable or unwilling to assume. As a result of the freezing of accounts in New York, the panic of 1857 was much more serious than it otherwise would have been. This crisis heralded a series of collapses in the banking system that were to plague the American economy throughout the remainder of the century and into the first decade of the next.

Central Banking

The absence of a strong centralized banking organization constituted the principal structural weakness of the American banking structure for some 80 years after 1833. In no other country has the unit system occupied such an important place. This peculiarly American institution came to dominate American banking after a heated controversy over the relative merits of centralized versus decentralized banking and after some 40 years' experience with the operation of the First and Second Banks of the United States.

As will presently be made clear, the withdrawal of the Government's deposits from the Second Bank in 1833 and the failure to extend the life of that bank beyond 1836 were events which, together with the enthusiastic adoption of the free banking principle a few years later, opened the way for the spread and triumph of a unit system of banking. It is, therefore, the abandonment of the principle of central banking that lends special interest to the history of the First and Second Banks, institutions that had actually performed the major functions of central banks from 1791 to 1811 and from 1816 to 1833.

The First Bank of the United States

Under the terms of a 20-year charter granted by Congress in 1791, the First Bank of the United States was organized along lines suggested by Hamilton the preceding year. Total capital was set at \$10,000,000, three-quarters of which was open to purchase by the public, the rest having been reserved for the Government. Its note issues, which were limited to the amount of its capital, were receivable for public dues as

and now amounting to \$1,265,000. are, to all intents and purposes, so much specie laid by for the redemption of our circulation; and that too, at a place altogether more convenient for the public, than at the counter of each Bank." Bank Commissioner's Report for Vermont (1852), p. 84.

²⁹ See below, Chapter 28.

long as the Bank maintained the ability to redeem its notes in specie on demand. Provision was made for the establishment of branches in the important commercial and financial centers.

The Bank was closely connected with the fiscal operations of the United States Government. Some \$13,500,000 was lent to the Treasury over the 20-year period; moreover, the Bank, acting as general fiscal agent for the Government, was the principal holder of Government accounts and through its eight branches facilitated the transfer of Government funds from place to place without charge. For the Government, the participation in the banking venture proved to be very remunerative: some \$700,000 profit was realized from the sale (between 1796 and 1802) of the original \$2,000,000 subscription. The lending operations of the Bank and its branches were extensive. Its loans were made customarily for 60 days, and were secured chiefly by commercial paper. As a result, merchants, manufacturers, and occasional wealthy landowners were its principal customers.

The First Bank performed important functions and services for the community as a whole. Its notes, issued in denominations of \$5 and upwards, had general acceptance throughout the country; they provided a standard type of money at a time when the Government was having difficulty keeping its notes in circulation.³⁰ Total circulation was kept at moderate levels, well within the limits set by the charter. The branches acted as clearing agencies for their respective districts and to some extent provided a national clearing system for state bank notes. Since the Bank held the principal specie reserves for the country, one of the reasons for limiting note issues was the desire to protect these reserves. By conservative issue and loan policies, the Bank maintained a general creditor position with respect to the state banks. This enabled it to check overexpansion on the part of the state banks, since it might threaten to call for payment in specie of these balances owed to it whenever the state institutions appeared to be exceeding the bounds of sound banking practices. Many of these activities, it will be noted, are of the kind usually associated with the operations of a central bank: holding specie reserves, serving as a lender of last resort, exercising control over the quality and quantity of the currency, and centralizing clearing for the banks as a whole. It is more than likely that these functions would have been expanded had the Bank's life been extended beyond 1811.

In spite of its accomplishments, however, and to some extent because of them, the renewal of the charter of the First Bank met strong opposition. Part of the opposition came from the state banks. These institutions felt that they would secure several advantages if they could

³⁰ See above, p. 253.

prevent a recharter of the Bank. Thus they thought that they would become the recipients of the Government deposits if their large and powerful rival could be eliminated from competition. In this connection, it should be understood that the First Bank's refusal to accept the notes of non-specie-paying state banks had created bitter antagonism inasmuch as this policy had restricted the profits of "wildcat" banks.

The obvious advantages of the First Bank as a financial institution would probably have been sufficient to offset this opposition had not personal and political considerations come into the picture. As an institution established by the Federalists, it was under fire from the Republicans. Personal antagonism to Secretary Gallatin by certain disgruntled spoilsmen intensified the opposition. In the course of the debates on recharter, the possibility of foreign control was raised. Actually, even though a large block of stock was held by Englishmen, the danger of foreign control was nonexistent, for the reason that under the charter foreign stockholders had no vote. The final decision on recharter was made early in 1811. The vote in the House was 65 to 64 against recharter. In the Senate there was a tie, 17 to 17, which was broken by a vote against the Bank by George Clinton, the vice-president. By such a narrow margin was the decision made.³¹

The demise of the First Bank was a signal for a sharp increase in the number of state banks. Within five years they expanded almost three-fold—from 88 to 246. Meanwhile those officials charged with Governmental finances had much cause to regret the failure to recharter the National Bank: faced with the necessity of financing the war that began in 1812, the Treasury sorely missed the services of the First Bank. In the absence of the clearing mechanism formerly supplied by that establishment, Government funds, now deposited with a selected group of state institutions, were difficult to transfer from one area to another. Moreover, since the notes of the state banks could not be circulated beyond a limited geographical area except at a discount, the Treasury suffered from a loss of purchasing power whenever Governmental receipts could not be equalized within each of the regions, a situation that often occurred.

For various reasons, the War of 1812 was financed chiefly through loans,³² and here again the absence of a national bank was unfortunate. Such a bank could have been of great assistance in the distribution of Government securities. State institutions, to be sure, bought large amounts of Government issues, but paid for them with notes of limited

³¹ In a most illuminating article James O. Wetterau suggests that the directors of the Bank were particularly inept in political matters. Their chief lobbying agent in Washington was "tactless and uncompromising." See James O. Wetterau, "New Light On The First Bank of The United States," *Pennsylvania Magazine of History and Biography* (July, 1937), pp. 284-285.

³² See below, Chapter 29.

acceptability. To make matters worse, the securities were then used by the state banks as a basis for further note issues, and in this way the banking system contributed markedly to the price inflation accompanying the prosecution of the war. In the autumn of 1814, all the banks outside New England suspended specie payments, an action that in turn made their notes subject to further depreciation.

The Second Bank of the United States

In spite of these difficulties, no agreement about the re-establishment of a United States Bank could be reached until after the close of the war, when Congress faced the problem of restoring some order to the highly disturbed monetary and banking system. Opposition came from the same elements that had brought about the end of the First Bank. Arguments against the new institution followed familiar lines: too much power would be concentrated in the hands of a few; the Government's connections with the bank would be dangerous; all these and many other objections were raised. Proponents of the new bank were successful, however, in getting a bill through Congress early in 1816.³³

Like its predecessor, the new institution was given a 20-year charter. Capital was set at \$35,000,000, four-fifths of which was open to public subscription, the remainder being reserved for the Government. Provision was made for 25 directors, 5 to be appointed by the President of the United States and the rest by the stockholders residing in the United States. The Bank's notes were to be receivable for all payments to the United States. Both notes and deposits were to be redeemable in specie, failure to make such redemption being punishable by a levy of 12 per cent per annum on the amount of the unpaid claims. Government deposits were to be made with the Bank, while the Bank on its part was to effect the transference of these funds without charge. Branches were to be established wherever the directors thought desirable.

The Second Bank began operations in July, 1816. A combination of ignorance, ineptness, and chicanery almost wrecked the institution during the first few years of its existence. Its first president, William Jones, was a political appointee who had no very clear conception as to how the Bank should be operated. The officers of the parent bank and the board of directors of many of the branches were likewise incompetent; consequently, the Bank entered into an unwise policy of expansion, especially in the Southern and Western portions of the country. By pledging the Bank's own stock for loans, several officials engaged in extensive stock speculation. In one case fraudulent practices were used to cover up the speculative activities of the president and cashier of

³³ After a bitter debate, the measure was passed by the House by a margin of 80 to 71. Little opposition was met in the Senate. See Ralph C. H. Catterall, *The Second Bank of the United States*, pp. 19-21. Chicago: University of Chicago, 1903.

the Baltimore branch. These events served to put the Bank into a precarious financial position by the latter part of 1818. At this point officials at the parent office in Philadelphia began hastily to contract its loans and note circulation. This action occurred at a most inopportune time, since the country was just recovering from the disturbances that had accompanied the recent war with England. The contraction by the Bank initiated a panic, leading one contemporary to observe that "the Bank was saved, but the people were ruined." Nor was it only the immediate effects that were unfortunate; the Bank incurred the ill will of thousands of people in the Western and Southern sections of the country, which proved to be an important factor in the later struggle over recharter.

In 1819 a new president, Langdon Cheves, was appointed. He immediately set about to improve the Bank's financial position by reducing loans and note issues and by arranging for imports of borrowed specie from Europe. These and other actions put the operations of the Bank on a more conservative basis. Because Cheves felt that his job was accomplished, and because the low dividends resulting from his cautious administration had caused dissatisfaction among the stockholders, Cheves resigned his position, and in January, 1823, Nicholas Biddle assumed the presidency.

It was under the management of its third president that the Bank began to develop its potentialities. A member of a prominent Philadelphia family, Biddle, when he assumed office at the age of 37, had already distinguished himself as a scholar, lawyer, and student of banking and monetary questions. He set about to increase the business done by the Bank without endangering its financial position: close supervision was exercised by the parent bank in Philadelphia over the operation of the various branches; loans on short-term commercial paper were increased; and dealings in domestic and foreign exchange were greatly expanded. Within a few years Biddle had clearly demonstrated his ability and skill as an executive.

The Bank's greatest importance stemmed from its position in the general monetary and credit structure of the country. Its notes, which were acceptable "from Montreal to Mexico City," added a much needed unity to the nation's monetary circulation, and the Bank's issues furnished an "elastic" currency, as a considerable volume of loans was made on short-term paper for seasonal needs. With branches in the important commercial centers, the Bank provided a convenient clearing system for the country. Its large dealings in domestic exchange further facilitated the interregional movement of funds. One of the most important accomplishments of the Second Bank was the practical elimination of discounts on state bank notes. Two devices were used to achieve this result. According to law, state bank issues were acceptable for

Government debts provided that the notes were redeemable in specie. The Second Bank was given the power to certify whether any state institution was meeting this requirement. To have its notes made unacceptable for Government debts was a serious blow to the prestige of any bank. Should this method prove ineffective, the Second Bank, which consistently maintained a creditor position in relation to the state banks, could present a collection of notes to the doubtful institutions for specie payment and thereby threaten their solvency.

The Second Bank also held the principal reserves of the banking system. It was in a real sense "the lender of last resort" in that it had to meet any large and unexpected demands for specie. Its policy under Biddle was to maintain a high ratio of specie to its liabilities. As added protection, the bank kept favorable balances with its European correspondents, upon which it might call for aid in times of emergency. The Bank handled all Government accounts and provided for quick and easy transference of funds between areas. Further aid was extended the Treasury in financing, and repayments of Government debts were handled through the Bank without disturbance to the money market.

From the foregoing account it may be seen that the Second Bank occupied a most important place in the national economy. This position was not achieved, however, without arousing animosity and antagonism in many quarters. Criticisms stemmed from many sources, ranging from complaints by disgruntled politicians over alleged discrimination in regard to loans, to the honest convictions on the part of many people regarding the constitutionality of the Bank. More fundamental was the popular distrust of a powerful private institution, especially in the banking field, and the dislike of the restrictions on monetary expansion, especially in the Southern and Western parts of the country. The latter point merits special attention. There can be little doubt that the Bank was operated on a conservative basis after 1819 and would have continued to act as a restraining influence upon expansion of bank credit in those areas that were most eager for an "easy money" policy.

Yet, in spite of criticism for its conservatism, under the guidance of Biddle the Bank had expanded its business, especially in the South and West, where credit demands were most urgent. In July, 1821, total discounts and holdings of domestic exchanges stood at some \$30,000,000, while the circulation of notes was around \$4,000,000. Ten years later, the corresponding items were something over \$57,000,000 and \$19,000,000.³⁴ To some extent these increases were at the expense of state banks, but on the whole the data indicate a considerable expansion. Had this policy been continued, there is no reason to suppose that the

³⁴ These data are from Ralph C. Catterall, *The Second Bank of The United States*, p. 501.

banking structure as a whole would have been placed in a financial straightjacket through the operations of the Second Bank.

The year that Andrew Jackson became President, in 1829, the prestige of the Bank was such that contemporaries were quite sure it had taken a permanent place in the American scene. But this opinion underestimated the strength of the opposition, which came from a number of sources: from those who doubted the Bank's constitutionality, from states that resented any infringement on their rights, from banks whose activities had been restrained, and from persons who felt that democracy was being threatened by the existence of a great "money monopoly."

The succeeding struggle over the question of recharter almost inevitably centered around the personalities of Biddle and Jackson. It would be difficult to imagine two persons more divergent in background, interests, and philosophy than the aristocratic gentleman from Philadelphia and the man of the people from the backwoods of Tennessee. Yet at the outset there seemed to be no differences between the two in respect to the Bank that could not be compromised. Jackson apparently had genuine doubts about the constitutionality of the institution, and he displayed some concern over its monopoly position. But on the whole he was not unfriendly to either Biddle or the Bank, and as a practical administrator he was quite aware of its services to the Government. Biddle, on his part, was willing to make concessions on many points in order to secure favorable action. The great danger lay in the possibility that the question would become a political issue and then fail to be decided upon its merits. This contingency Biddle resolved at first to avoid; but partisans on both sides tended to show a regrettable lack of restraint in their arguments, and, moreover, Jackson's public statements appeared less conciliatory in tone than Biddle had expected them to be. Biddle was under increasing pressure from opponents of the President to push for recharter and in this way make the Bank an issue in the presidential election of 1832. After much consideration, Biddle finally decided on this policy. A bill for recharter was passed by Congress in July, 1832, and was promptly vetoed by Jackson, who by this time was thoroughly convinced that the Bank was a dangerous institution. The question of the recharter became one of the principal issues in the political campaign. Jackson's overwhelming victory left no doubt concerning the final decision, and the Bank ended its existence as a national institution with the expiration of its charter four years later, a victim principally of political ineptness on the part of its proponents.³⁵

³⁵ In 1836 the Second Bank secured a charter from Pennsylvania. Although Biddle continued to act as president, the institution entered into several speculative ventures and finally failed in 1841. While creditors were fully paid, the stockholders received nothing on their entire investment. Biddle, who lost his personal fortune, died three years later.

The Independent Treasury

In 1833 Jackson decided that the Government's deposits in the Second Bank should be withdrawn and placed in selected state institutions. Accordingly, contracts were made with a group of state banks which agreed to perform the same services for the Government that formerly had been rendered by the Second Bank. Meanwhile, as has been noted,³⁶ the number of state banks was rapidly increasing. Unfortunately, a large proportion of the funds from these newly created institutions went into speculation, especially for the purchase of land. The "speculative bubble" burst early in 1837, and was followed by a restriction in the money markets, a sharp drop in prices, and other events associated with panic conditions, including a general suspension of specie payments by banks throughout the country.

As a result of the panic, the Federal Government suffered much inconvenience and some losses on the deposits it had made in the state banks. Agitation was started in Congress to provide some way of safeguarding Government funds. In response to a sort of financial atavism, it was proposed to establish a number of "strong boxes" throughout the country in which Government funds should be kept. In order to divorce Federal finances completely from the banking system, all payments to the Government were to be made in the form of specie or the Government's own obligations. This system, called the "Independent Treasury," was first put into effect in 1840, only to be repealed the following year. But in 1846 the plan was again adopted by Congress, and, beginning in January, 1847, the provision regarding payments in specie or Government notes went into effect.

From the standpoint of the financial and banking structure of the country, a less promising institution can scarcely be imagined. The difficulties arose from the fact that unless payments into the Treasury happened to coincide with disbursements of equal amounts, there would be a drain upon the commercial banks, principally in the form of specie drawn from their reserves. To the extent the banks customarily kept some sort of fixed relationship between their loans and their specie holdings, this "hoarding" of specie by the Treasury could easily cause a wholly arbitrary stringency in the total volume of bank credit. On the other hand, an unwarranted expansion of bank credit could occur if the Government's disbursements exceeded its receipts. By its very nature, the Independent Treasury exercised certain functions of a central bank but without necessarily assuming any responsibility for the effective operation of the monetary and banking system. Fortunately, the potentialities of the institution for disturbances were neutralized to some

³⁶ See above, p. 258.

extent by various Secretaries of the Treasury, who violated the spirit of the original law by keeping a substantial portion of the Government's deposits with the banks and by occasionally making disbursements to ease a stringent monetary situation.³⁷

Conclusion

To make an accurate appraisal of the operations of the American banks during the period between 1789 and 1861 is difficult. The great variety of experiments carried on at different times and in different regions makes any generalization subject to numerous exceptions. There is little doubt, however, that the "easy money" policy that found almost universal expression in our banking institutions led to a more rapid economic development than would have occurred under a more conservative regime. The ability to "create" credit without much regard for specie reserves made possible the promotion of large numbers of undertakings that would otherwise have been delayed. This development did not take place without some losses in economic efficiency. Numerous ill-conceived projects resulted in a wastage of labor and materials. The burden of such failures fell largely upon the holders of depreciated or worthless bank notes or deposits, who in many instances were at least able to bear the losses, and who indirectly contributed the capital to many business enterprises.

Yet it can be argued that, except for the two inflationary outbursts between 1812 and 1815 and between 1835 and 1837, the monetary and banking system functioned on the whole in a fairly effective manner. To be sure, borrowing for purposes of speculation was never absent from the scene, but credit, which came principally from the banks, was expanded largely for the purpose of financing the production and marketing of goods and services. With the exceptions noted, fluctuations in general prices were not beyond the limits expected from the operation of an economic system of free private enterprise.³⁸ By 1861 the "wild-cat" type of banking, which had something of the zonelike development that has characterized so much of American history, had largely disappeared. Apparently each region had to learn its own lessons from experience before reforms were put into effect. Except in areas like that served by the Suffolk System, bank notes continued to circulate at different values, a fact that added somewhat to the difficulties of doing business. But after the end of the Second Bank, the greatest deficiency of American banking was the absence of any central control over the banking system as a whole. There was no institution to post storm warnings of threatened financial difficulties, to take positive steps to

³⁷ See David Kinley, *The History, Organization, and Influence of the Independent Treasury of the United States*. New York: Thomas Y. Crowell Company, 1893.

³⁸ For a detailed account of the operations of the American economy during the period, see Walter B. Smith and Arthur H. Cole, *Fluctuation in American Business, 1790-1860*. Cambridge, Mass.: Harvard University Press, 1935.

prevent booms from reaching dangerous proportions, and to stand ready to extend assistance in times of economic distress. The banking structure rested upon a foundation that was subject to periodic collapse.

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CHAPTER 14

The Capital Markets, 1789-1860

WITHOUT THE NECESSARY CAPITAL, the rapid growth of agriculture, manufacturing, commerce, and transportation during the first half of the nineteenth century would have been impossible. The demand for funds was great. The supply came from the surplus capital of Europe and from increasing savings in the United States, supplemented by the working of the credit mechanism already discussed. Businessmen of the period combined old methods with new institutions and techniques to provide the funds for those who were building the economic life of the country in these momentous years. Throughout the period there was an increasing fluidity of capital interrupted only by the crises that occurred in this period before the War Between the States.

The demand for long-term loans to provide investment capital increased, especially after 1815. Until this date there were few securities besides Federal bonds to attract investors or to require the services of financial middlemen. In the years that followed, the promising opportunities of the West and the need for capital to finance internal improvements provided the incentive.¹ Especially during the twenties and thirties the states borrowed money to aid private companies building turnpikes, canals, or railroads and to forward banking. Banks, canals, and insurance companies all issued securities in large amounts. The railroads, particularly in the 1850's, were heavy borrowers. The Federal Government entered the market several times during the first half of the century, and a number of municipalities also became debtors.

These more visible evidences of debt do not tell the whole story, however. During this period the individual proprietorship and the partnership were very common in both commerce and manufacturing. Even large firms made no public appeal for capital but obtained their resources from the owners who put their profits back into the business and called on relatives and friends to contribute to the invested capital of the concern. In many cases the local market absorbed securities issued for small public improvements, mining ventures, or manufacturing enterprises. Merchants, wealthy retired persons, rich widows, even

¹ G. S. Callender, "The Early Transportation and Banking Enterprises of the States in Relation to the Growth of Corporations," *Quarterly Journal of Economics*, Vol. XVII, No. 1, November, 1902, pp. 115, 131.

small savers bought the securities directly.² The form of the business was changed but there was little or no general appeal for funds.

The need for short-term credit was also great, especially for commercial pursuits. Loans for these purposes were provided in many ways other than those discussed under commercial banking. The very designation "short-term loan" appears somewhat a misnomer; perhaps the clearest distinction to be made is that credit that should be classified thus was granted for the purpose of providing working capital.³ In a period when transportation and communication were relatively slow, the credit terms were necessarily longer than would later be considered short. Frequent renewals often extended loans for many months and even years.

Financial Centers and Institutions

Only a few cities were important centers for those who needed large amounts of capital. Although the United States was developing her own financial markets, foreign capital was a significant part of the supply throughout the whole nineteenth century. London was already a well-developed financial center, and Americans in need of money frequently solicited funds in the English city. Through the methods used, some of the profits of British trade and industry flowed through London to the United States. The promises of the rapidly growing economy of a new country, the high interest offered on bonds, and the pleasing returns realized by owners of early issues of stocks attracted both British and Continental investors. Agents wishing to raise funds might appeal to houses in Amsterdam, Rotterdam, Paris, and Hamburg, but throughout this period the United Kingdom was the leading exporter of capital to the United States and the rest of the world.

In the United States itself some cities outstripped others as financial centers. At the beginning of this period Philadelphia stood out in the country's financial affairs. The early development of banking and the establishment of the First and later of the Second Bank of the United States in that city gave it considerable advantage. Philadelphia was also an important center for both domestic and foreign trade. New York City, however, had attractions that gained for it financial leadership. It surpassed Philadelphia in the quantity of imports and exports of merchandise. With a good harbor at the mouth of the Hudson, New York benefited from the developing manufacturing industry of New England and from the growth of the West. Transportation facilities were im-

² Joseph Stancliffe Davis, *Essays in the Earlier History of American Corporations*, pp. 298-300. Cambridge, Mass.: Harvard University Press, 1917.

³ See Harold G. Moulton, *Financial Organization and the Economic System*, pp. 100-101. New York: McGraw-Hill Book Company, Inc., 1938. The reader will find this book a useful reference for financial terms and functions.

proved by the opening of the Erie Canal and by the building of the railroads. The first line of regular packet ships began operation from New York in 1818, thus giving to the city advantages in foreign trade, while the aggressive new techniques of New York businessmen attracted merchants who came East to purchase goods.⁴ The financial supremacy of New York, based on its commercial leadership and the resulting accumulation of wealth, developed it as a real national center in investment and commercial credit.⁵

Important as New York had become by the second quarter of the nineteenth century, the sum total of financing in other markets must not be ignored. The financial business of several cities was very important for their respective hinterlands: Philadelphia, Boston, New Orleans, and, later, St. Louis, Chicago, and many smaller cities developed considerable capital markets to serve local needs. In New England accumulated wealth from foreign trade was ready to flow into manufacturing and Western railroads. In the growing cities of the West and South new firms were set up and branches of old houses established to help facilitate the movement of capital from Europe and the East to these frontier sections.

The flow of capital from the East to the newer parts of the country is not easy to trace. Some is evident in records of indebtedness—for example, the sale of bonds in the East, or promissory notes signed by Western debtors. A large aggregate of capital was taken West by the many settlers who individually carried with them small quantities of tools, other equipment, food, and even a little money.

The expanding volume of business during this period stimulated the evolution of financial middlemen to serve persons who wished to obtain funds and those with a surplus to invest. Many of the houses established were not specialized but carried on a variety of undertakings, sometimes combining financial activities with mercantile pursuits. Some firms gradually became specialists, devoting most of their attention to some particular lines, but for the most part this was an age of diversification and business opportunism, not specialization. At the same time the early development of methods of performing certain financial functions may be recognized and the evolution of several institutions is foreshadowed in the activities of these pioneer firms. In the light of the knowledge of what happened later some houses of the period can be considered investment banking firms, or other specialized financial establishments in embryo, even though at the time they dealt in merchandise as well as bonds, sold lottery tickets as well as commercial paper, or

⁴ Robert Greenhalgh Albion, *The Rise of New York Port*, pp. 13-15. New York: Charles Scribner's Sons, 1939.

⁵ Margaret G. Myers, *The New York Money Market*, Vol. I, *Origins and Development*, pp. 3-9. New York: Columbia University Press, 1931.

performed some of the functions of a commercial bank in addition to marketing issues of new securities.

The Importation of Capital

One group of houses that aided in the financing of business enterprises during this period was located in England. Although they carried on many activities, the chief business of the Anglo-American merchant bankers, as they were called, was the financing of American enterprises. Besides a number of small firms during the middle 1830's, when the export of capital from Great Britain reached one of its early peaks, the leading houses were Thomas Wilson & Company, George Wildes & Company, Timothy Wiggin & Company, Lizardi & Company, Morrison, Cryder & Company, Baring Brothers & Company, Rothschild & Sons, and W. and J. Brown & Company.⁶ Other businessmen were attracted to the field, especially after the difficulties experienced in 1837 had caused the failure of the first three houses mentioned.

The firms had varied origins and grew out of diverse interests. The house of Rothschild had its beginnings in Frankfurt, Germany, and retained interests on the European continent. The Barings developed from the London office of a wool-exporting firm in Exeter.

In several cases some of the partners in these merchant-banking houses were Americans. It is natural that a firm that needed to know about conditions in the United States would include among its members men with personal experience there; it is understandable that an American who had lived in England for some years could appreciate the financial opportunities available. Baring Brothers & Company, which played the leading role in the period from 1815 to 1860, included two merchants who had served their apprenticeship in New England: Joshua Bates had gone from Salem to Boston and then to London as a merchant; Russell Sturgis went to Baring Brothers & Company *via* Manila and Canton. After making a fortune in Chile, John Cryder, another American, became associated with the Morrison firm in London for a few years during the middle 1830's. George Peabody, a native of Massachusetts, after years of purchasing dry goods in Europe for his firm in Baltimore, saw the openings in international finance for a man with both a knowledge of conditions in America and established connections. He founded George Peabody & Company, and, in 1854, when he sought a new partner, he insisted on adding an able American to the company. Junius Spencer Morgan, formerly a dry goods merchant in Boston was chosen, and his son, J. Pierpont Morgan, in 1860 established his firm in New York as the agent of the London house.

⁶ R. W. Hidy, "The Organization and Functions of Anglo-American Merchant Bankers, 1815-1860," *The Journal of Economic History*, Vol. I, Supplement, December, 1941, pp. 53-55, 65-66.

Contact between houses in England and firms in the United States was maintained in several ways. Business was occasionally undertaken by houses on both sides of the ocean on a straight commission basis. Some of the larger houses sent agents to the United States. Thomas Wren Ward of Boston served Baring Brothers & Company in this capacity for 23 years. August Belmont, who came to the United States in 1837, acted for the Rothschilds through his house in New York. On the other hand, some private bankers in the United States specialized in foreign business and often initiated transactions that they placed on joint account with houses abroad. This procedure was practical, inasmuch as profits were shared between two houses with special skills and facilities to forward a transaction in the two countries. In other instances a close relation was sustained by means of interlocking partnerships. Alexander Brown & Sons of Baltimore, for example, was founded by an Irish immigrant whose business in importing linen expanded into a general mercantile and financial enterprise. Brown's sons established houses in Liverpool, Philadelphia, and New York and these allied partnerships, with agents in Boston and in the South, were well placed to serve the interests of all concerned.⁷

The flotation of long-term loans was an important service afforded by these Anglo-American merchant bankers. Through their agency many securities were purchased during this period by both British and Continental investors. Sometimes the selling in Europe was done entirely on a commission basis; if no advance of money was involved, the charge was only 1 per cent. The English firms, however, benefited from other commissions on the payment of interest and principal on the American securities held in Europe. In some instances a house in London purchased an issue on joint account with a firm in the United States and shared the profit or loss that resulted. In other cases the London concern undertook to market the whole of a small issue at its own risk.⁸

Several methods of appealing to the investing public were developed. By the 1850's advertisements in newspapers, appealing circulars, and other publicity devices were quite common. A firm in London would also make offers to houses on the Continent if the issue was of such a type and floated at such a time that German, Dutch, French, and other investors might be attracted.

The Anglo-American merchant bankers served the security market in further ways. They facilitated the buying and selling of old issues of securities. Often discretionary orders were sent to them to buy in

⁷ John Crosby Brown, *A Hundred Years of Merchant Banking*, pp. 3, 8, 23, 25. New York: privately printed, 1909.

⁸ For an interesting example see R. W. Hidy, "The Union Bank of Louisiana Loan, 1832: a Case Study in Marketing," *The Journal of Political Economy*, Vol. XLVII, No. 2, April, 1939, pp. 232-253.

the European market; in other instances they dealt on their own initiative through their agents in various markets.⁹ When securities were depreciated, or the conduct of the borrower was in doubt, the houses attempted to safeguard their clients' interests in the United States.¹⁰

Although the trans-Atlantic capital movements in the form of long-term loans often attracted more attention, the flow of capital in the form of short-term credits was also significant. Whether the merchant was American, British, or some other nationality, he often depended, at least in part, on the British money market to finance his export or import trade with the United States. Over this period the rates charged and the conditions governing credits changed frequently, but certain generalizations can be made about various sections of the trade.

When a merchant in the United States wished to import British goods he turned, particularly during the second quarter of the nineteenth century, to the London money market to provide his working capital. In some instances he was granted credit on the books of the manufacturer or merchant from whom he made his purchases.¹¹ If the American merchant visiting England was well established and favorably known, he might ask the creditor to draw a bill of exchange on him, and so postpone the date of payment for the three or four months that would pass before the draft reached maturity.¹²

More often the short-term credit was arranged through the services of an Anglo-American merchant banker and the London money market. Granted a credit on a merchant banker, the American importer either drew against it himself or authorized his creditor to draw. The British firm accepted the bills, expected to be remitted funds by the American merchant upon or before the maturity of the drafts, paid the bills when due, and charged a commission for accepting and paying. By accepting drafts the merchant bankers lent their names and credit, and the bills became negotiable in the London money market. The actual funds to convert the acceptances into cash usually were provided through the agency of the bill brokers and discount houses, which, by 1810, were well qualified to perform this function. These specialists in the bill market provided an outlet for the surplus funds of banks in manufacturing and other districts of Great Britain. Firms such as Overend, Gurney & Company, the leading house dealing in bills during this period, paid interest to banks for the use of deposits and advanced the money

⁹ *Peabody Papers*, 1837-1854, *passim*. Salem: unpublished manuscripts in the Essex Institute.

¹⁰ For examples, see Reginald C. McGrane, *Foreign Bondholders and American State Debts*, pp. 72-81, 96-98. New York: The Macmillan Company, 1935.

¹¹ For details see Norman Sydney Buck, *The Development of the Organisation of Anglo-American Trade, 1800-1850*, pp. 114-116, 133. New Haven: Yale University Press, 1925.

¹² *Peabody Papers*, 1830-1839, *passim*. Salem: unpublished manuscripts, Essex Institute.

on drafts at a discount from the maturity value. In turn, if necessary, they could appeal to the Bank of England for rediscounts.¹³ The merchant banker lent his credit; the discount house acted as a reservoir for the British capital; the seller of the goods was reimbursed; and the American merchant was given several months to meet his payments.

The terms and charges of the merchant bankers varied with the goods involved and the country to which the merchant was making his shipments. For the importation of British dry goods to the United States, especially during the 1830's, an open revolving credit was granted. Against this the merchant or his agent could draw in Great Britain in bills at three or four months' date for a charge of 1 per cent. Thousands of tons of railroad iron were shipped to the United States under similar arrangements, but the importer was usually given the right to draw on the merchant banker only for a particular operation. The terms further stipulated that a bill of lading bearing evidence of the amount of metal shipped should accompany the draft.

Exports of goods from the United States also were financed by the British market. One important crop, cotton, might serve as an example. The firms to which cotton was sent for sale accepted drafts to the extent of two-thirds or three-fourths of the value of the invoice. The plantation owner either directly or indirectly through a factor or merchant received payment for a draft on the British importer, which was then sent to England for acceptance and payment.¹⁴ Quite often a New York house acted as an intermediary in the transaction inasmuch as the demand for British funds was small in the South. In this case the firm that took the drafts in return for payments to the planters would reimburse itself by drafts on New York. The house in the Northern city completed the chain by drawing against a credit in England, and arranging to cover it with the cotton bills forwarded to England. Such three-cornered operations in exchange were carried on by several firms; but after the Second Bank of the United States ceased to dominate the field of foreign exchange, the houses of the Browns, with their agents in Southern cities, were the strongest competitors for this type of business.¹⁵

Not only were the other exporters of American produce, including wheat, flour, and tobacco, financed in this way, but also American merchants in various parts of the world found short-term credits available to aid their business. A merchant shipping coffee from Brazil to the

¹³ W. T. C. King, *History of the London Discount Market*, pp. 5-14, 117-128, 264-265. London: George Routledge & Sons, Ltd., 1936.

¹⁴ Norman Sydney Buck, *The Development of the Organisation of Anglo-American Trade, 1800-1850*, Chapters 3 and 4. New Haven: Yale University Press, 1925.

¹⁵ John Crosby Brown, *A Hundred Years of Merchant Banking*, pp. 280-281. New York: privately printed, 1909. The book contains a brief discussion of the seasonal changes of domestic and foreign exchange rates.

United States could obtain the right to draw drafts covered by bills of lading. Especially after 1825 an American merchant who shipped tea or silk from China to Europe or to the United States was likely to finance the shipment by drawing against a credit on an Anglo-American merchant banker.

These credits received in the British market were the basis for a further extension of credit in the United States. The case of dry goods importations is one in point. The importer in New York, Philadelphia, or Baltimore, financing his imports by means of three- or four-months bills on a London merchant banker was able to extend credit facilities to the jobber or wholesaler. In turn they gave the retailer lenient terms. The final purchaser of the goods, who might well be a farmer who paid his debts from the annual proceeds of his crop, was at the end of this long chain of credit.

Banks in the United States also benefited by credits extended by Anglo-American merchant bankers. The purposes for which they borrowed varied, but revolving credits were often arranged to facilitate dealings in foreign exchange. Although even in the 1840's some merchants balanced imports of goods with exports, or bought exchange directly from another merchant, some time before that date certain merchants were known to make a specialty of such dealings and chartered banks had also undertaken the function.¹⁶ To supply American merchants with pounds sterling for the payment of foreign debts, the bank or merchant-banking firm drew against a credit granted in London; later it remitted to cover by sending bills of exchange drawn by Americans on British importers. The Bank of the United States was active in this field, especially between 1831 and 1836, when it held a credit of £250,000 on Baring Brothers & Company for this purpose.

Similar institutions secured credits in London for other reasons. The Second Bank of the United States negotiated several large loans there; in 1819, for example, to tide it over a difficult period, a \$2,000,000 three-year loan was arranged in Europe.¹⁷ In 1822 the Bank of New York and Trust Company, having been refused by the legislature the right to increase its capitalization, turned to the London market to negotiate a credit.¹⁸ In this way the American market was supplied with funds from England indirectly through the facilities accorded to banks.

The flow of capital from Europe to the United States fluctuated a

¹⁶ Arthur H. Cole, "Evolution of the Foreign Exchange Market of the United States," *Journal of Economic and Business History*, Vol. I, No. 3, November, 1923, pp. 385-390.

¹⁷ Ralph C. H. Catterall, *The Second Bank of the United States*, p. 71. Chicago: The University of Chicago Press, 1903.

¹⁸ Allan Nevins, *History of the Bank of New York and Trust Company, 1784 to 1934*, pp. 46, 55. New York: privately printed, 1934.

great deal in the period 1789 to 1860. These years opened with a foreign debt and with a new flow of funds from Europe. Borrowing was interrupted by the War of 1812 and did not amount to much in the postwar years. During the 1830's, however, the total of both long- and short-term loans grew rapidly. The bonds of Eastern states issued to aid public works and the securities of Southern and Western states to promote banking and internal improvements found a ready market in Great Britain. Stocks and bonds of private corporations, banks, insurance companies, mining companies, canals, and railroads were also owned abroad. In addition to the securities marketed by the Anglo-American bankers many others reached Europe. When American merchants wishing to make payments found pounds sterling high, they often remitted securities. In 1836 and later Samuel Jaudon, agent of the Bank of the United States, took a large volume of securities abroad as collateral for needed loans. Other firms in the United States sent smaller quantities of stocks and bonds to the European market.¹⁹ Various estimates have been made of the total of securities, short-term obligations, and direct investments in land held abroad. A total of \$225,000,000 may be said to give a reasonable picture of the foreign indebtedness of Americans in 1843.²⁰

The panic of 1837 was followed by a brief recovery in 1839, and after that came a long depression during which the credit of Americans in Europe suffered. Three Anglo-American houses failed in 1837 and others were embarrassed. The Bank of the United States, now a state bank, tottered and finally fell. The European holders of its stock suffered losses. In 1841 and 1842 eight states and one territory stopped payment of interest.²¹ Whatever the causes of the defaults—overexpansion, a sudden break in the flow of funds, inadequate taxes, irresponsible leadership—the European investors were discouraged. Conditions for the granting of short-term credits were tightened and American securities remained depreciated on the market. An attempt was made to persuade the Federal Government to assume the debts of the states but without success. In 1842, when an agent of the United States visited Europe, he found the merchant bankers unwilling to market Federal bonds because of the investing public's lack of interest.

Within six years, however, the credit of Americans was reinstated. All but two of the states were prepared to meet their obligations, economic conditions in the United States had improved, the development

¹⁹ Leland Hamilton Jenks, *The Migration of British Capital to 1875*, pp. 64, 85, 92, Chapter 3. New York: Alfred A. Knopf, 1927.

²⁰ Cleona Lewis, *America's Stake in International Investments*, p. 520. Washington, D. C.: The Brookings Institution, 1938. See Appendix B, "Estimates of Foreign Investments in the United States."

²¹ Leland Hamilton Jenks, *The Migration of British Capital to 1875*, p. 103. New York: Alfred A. Knopf, 1927.

of the old Northwest, particularly the building of railroads there, offered a fresh investment opportunity. By the end of the 1840's, short-term credits were increasing and had become very important in financing the purchases of rails. Europeans again were willing to invest in enterprises in the United States. French, Dutch, Swiss, and especially German investors looked from the disturbed conditions of Europe to the rapidly developing economy of a young nation.²² Although the flow of capital was interrupted by the Crimean War and financial crises in 1854 and 1857, the total exportation of capital grew from 1848 to 1860. One estimate of the aggregate foreign indebtedness of the United States by 1857 is \$375,000,000.²³

During this period of renewed interest in investments in the United States there was a change in emphasis on the techniques of financing them. The Anglo-American merchant bankers continued in some cases to market an issue at their own risk in the European market. Very often, however, a house in the United States took over the securities and arranged for sale of part of them by English firms either on commission or for a share in the profits. Furthermore, with improved communication between Europe and the United States, more foreign investors were sending their orders for securities directly to the New York market.²⁴ The United States still looked to Europe for capital. Large blocks of American bonds and stocks, even of those issues floated in the United States, reached the British market, but the domestic money market had been developing and was able to take more of the initiative. Agents continued to visit Europe to sell securities and short-term credits directly aided in the building of railroads as well as in the financing of imports and exports, but by the fifth decade of the century the American money market had achieved a new maturity.

Investment Market in the United States

Within the United States between 1789 and 1860 a variety of firms and techniques emerged to implement the flow of capital. In the early period, merchants were almost the sole representatives of finance in the American money market. Chartered banks were very few, and their boards were made up almost entirely of merchants. Thus both long- and short-term credit was in the hands of the mercantile community. As time passed some of these merchants became private bankers; others retained their diversified interests, leaving their security and exchange operations to secondary importance. Unlike the chartered banks, these

²² R. W. Hidy, "A Leaf from Investment History," *Harvard Business Review*, Volume XX, No. 1, Autumn, 1941, pp. 66-67.

²³ Cleona Lewis, *America's Stake in International Investments*, p. 522. Washington, D. C.: The Brookings Institution, 1938.

²⁴ *Peabody Papers*, 1850, *passim*. Salem: unpublished manuscripts, Essex Institute.

private firms were not restricted as to the area in which they might operate and some of them extended their branches or agencies over the country.

Before the issue of securities became the predominant method of raising capital to finance new enterprises some private banking firms handled lotteries to aid in raising funds, a method not uncommon at the end of the eighteenth and in the early nineteenth century. The purchaser gambled on a prize, the project secured capital, and the house that sold the tickets received for its service a percentage of the money raised. By 1833 there were 200 lottery offices in Philadelphia alone. S. & M. Allen and Company, which had grown out of a general business established in Albany in 1808, was one of the firms carrying on this type of business, among other activities, through its branches in several cities of the North and South. In 1817, for example, it contracted to sell lottery tickets for the Union Canal Company of Pennsylvania.²⁵ Other means of financing developed, and both public opinion and legislative action hastened the decline of this method of raising funds in the 1830's.

During the early years of this period, some chartered banks made long-term advances directly to borrowers. Through long-dated and frequently extended notes, banks made loans that in reality provided investment capital, although the form was that of a short-term credit.²⁶

With the increase in the number of issues of new securities many firms competed for the handling of stocks and bonds. In the early part of the century Stephen Girard, John Jacob Astor, and David Parish were associated with the Federal issue of 1813 and the promoting of the Second Bank of the United States. Later, the private banking houses of Prime, Ward & King, Nevins, Townsend & Company, Astor & Sons, and Brown Brothers & Company competed with such chartered banks as the Bank of the United States and the Bank of Manhattan Company.²⁷

Securities were placed on the market by various methods. Small issues were handled by an incorporated or local private bank, which disposed of its holdings through correspondents in other centers, if the immediate market would not absorb all the securities. Larger issues were usually negotiated in a city such as New York, Boston, or Philadelphia. Sometimes the bank acted as an agent selling on commis-

²⁵ Henrietta M. Larson, "S. & M. Allen—Lottery, Exchange and Stock Brokerage," *Journal of Economic and Business History*, Vol. 3, No. 3, May, 1931, pp. 424, 430-432.

²⁶ Bray Hammond, "Long and Short Term Credit in Early American Banking," *Quarterly Journal of Economics*, Vol. XLIX, No. 1, November, 1934, pp. 83-84, 88, 89; Catterall, Ralph C. H., *The Second Bank of the United States*, pp. 160-161 (Chicago: The University of Chicago Press, 1903).

²⁷ Margaret G. Myers, *The New York Money Market*, Vol. I. *Origins and Development*, pp. 23-24. New York: Columbia University Press, 1931.

sion; at other times the middleman contracted to buy the securities at a discount and market them at his own risk, and in some instances a call was made for sealed bids.

A few houses devoted their attention to special types of securities. John Ward of New York was associated with Federal financing in the 1840's, but it was W. W. Corcoran of Washington, D. C., who played the leading role in the large issues of 1847 and 1848. Corcoran had established his house of Corcoran & Riggs in the national capital in 1840. Prior to that time this son of an Irish settler in Georgetown, D. C., had been a businessman on a small scale. He had entered the mercantile field, and then, after a failure in 1823, had turned his attention to real estate and domestic exchange. Next he formed a partnership with George Washington Riggs, the young son of Elisha Riggs, a New York financier. Land and securities became the chief interest of Corcoran & Riggs. Pleased with its success in outbidding the New York houses for the greater part of the \$18,000,000 Federal loan of 1847, the firm submitted a sealed bid for the new issue of 1848 at a 3.02 per cent premium. It was awarded \$14,065,550 of the \$16,000,000 20-year 6 per cent bonds. Even before making the bid, Corcoran and Riggs had arranged to share it with others. Of the approximately \$5,000,000 to be taken by other houses, \$1,250,000 went to Baring Brothers & Company. Further sales were made in the United States; but when the market lagged, Corcoran visited Great Britain and disposed of about \$4,000,000 more in the foreign market. The premium offered was high, and it was fortunate for the Washington house that the end of the Mexican War and the improvement in the European market for American securities both came in time to forward the undertaking.²⁸ It was a big transaction for the period, and the house of Corcoran & Riggs made a good profit from its operations.

In addition to the Mexican War loans many other issues of securities provided business for the private bankers in this period. The growth of railroads, the development of Western states, and municipal borrowing all gave rise to a large flow of securities, especially during the 1850's. The number of private bankers had grown in the previous decade and by 1854 the *American Bankers Magazine* listed 18 in New York, 10 in Boston, 20 in Philadelphia, and 15 in St. Louis.²⁹ The increase in the issue of stocks and bonds offered business opportunities for these and other houses.

As the quantity of securities already issued grew, the dealings in stocks

²⁸ Riggs Papers, 1847-1848, *passim*. Washington, D. C.: unpublished manuscripts, Library of Congress.

²⁹ Henrietta M. Larson, "E. W. Clark & Co., 1837-1857. The Beginning of an American Private Bank," *Journal of Economic and Business History*, Vol. IV, No. 3, May, 1932, pp. 442-443.

and bonds increased. At first merchants acted as agents for those wishing to buy or sell securities but specialists in handling these transactions emerged. For fear of being accused of considering interests other than those of their clients, the more conservative among them refused to assume any functions beyond the buying and selling of securities for others.³⁰

Institutions were developed to facilitate the exchange of previously marketed securities. As early as 1792 the brokers in New York had come to an agreement in regard to commissions, but at that time the limited number of securities did not justify more formal organization. In 1817 a committee was formed to report on methods of procedure and the New York Stock and Exchange Board was organized. At first the president of the association read once each day the list of securities and gave an opportunity for trading. Actual transactions were registered and rules were made forbidding fictitious sales and contracts.³¹ Unless otherwise stipulated, sales had to be settled for on the next day succeeding the date of sale, but until later many transactions were contracted for on longer credit.

As experience was gained and the volume of trading grew, new rules were imposed. The transactions of one of the early stock manipulators, Jacob Little, is credited with causing the adoption of one policy. In 1840 Little sold a number of Erie Canal shares at seller's options running from six months to a year. Attempts to corner him failed because he held Erie bonds that could be converted into stock. The affair hurt the prestige of the Exchange, and the duration for seller's options was limited thereafter to 60 days. With the exception of one act of New York State designed to prevent short selling and later repealed, the voluntary unincorporated association of the Exchange set its own rules.³²

Important as was the New York Exchange, a sizable volume of business was carried on outside of its jurisdiction. A rival board existed in the city from 1836 to 1848. Brokers outside of the Exchange engaged in buying and selling, and operations in other cities were not negligible. The brokers of Philadelphia had organized early. The Boston Stock and Exchange Board was formally established in 1834; it played an important part in security transactions of the New England manufacturing companies, and by 1863 the volume of business justified two sessions daily.³³ As other cities grew, exchanges were set up; San Francisco had

³⁰ *Peabody Papers*, for example, Delauney, Iselin & Clarke, New York to G. Peabody, London, October 17, 1851. Salem: unpublished manuscripts, Essex Institute.

³¹ J. Edward Meeker, *The Work of the Stock Exchange*, rev. ed., pp. 63-65. New York: The Ronald Press Company, 1930.

³² N. S. B. Gras and Henrietta M. Larson, *Casebook in American Business History*, pp. 328, 329. New York: F. S. Crofts & Company, 1939.

³³ Clarence W. Barron and Joseph G. Martin, *The Boston Stock Exchange*, no paging. Boston: Hunt & Bell, 1893.

one by 1862.³⁴ In spite of this competition, New York became and remained the great center for operations in securities. The mail service of the railroads, the development of the telegraph, and the progress of the steamboat increased the speed with which clients could send orders to this active market. Foreign dealers sent orders directly to New York, especially after 1850.

Another advantage offered by New York was the call-loan market. The Stock Exchange was well developed before the growth of the call-loan market but the new mechanism increased the facilities for obtaining funds for operations in securities, especially in the city.³⁵ Funds were available and the temporary nature of their deposit determined that the loans should be callable on demand.

The supply of the funds came mainly from the deposits of bankers' balances in incorporated banks and with private bankers and brokers in New York. There were several reasons why sums accumulated in this commercial and financial center. Payments had to be made there for the purchase of imports and domestic goods. The fact that commercial paper with names of well-known merchants of the city was a good investment also attracted funds, while the premium on New York money and the need of banks to retain balances to redeem their own notes in that city encouraged institutions to allow funds to pile up. Other cities also attracted these balances and the pull of Boston resulted in comparatively small deposits by Massachusetts banks in New York during this period, but the flow of funds from banks in other states was preponderantly to New York.

The institutions holding these funds on interest were eager to invest them in such a way that the money would be available if the deposits were demanded. Thus the call loan developed. The purchasers of securities were attracted by the low interest charged on loans subject to call and the stocks and bonds themselves afforded the collateral security.

This mechanism influenced the operations of the stock market at the same time that other developments forwarded the changes. More rapid transfer of shares was facilitated by the fact that registered shares could be assigned in blank, and because the telegraph increased the speed of communication with traders in other regions. By 1857 the most frequent method of dealing on the New York Stock Exchange was by daily settlement; funds were provided by the call-loan market.

Although the difficulties arising from this close connection between

³⁴ Jos. L. King, *History of the San Francisco Stock and Exchange Board*, p. 1. San Francisco: Jos. L. King, 1910.

³⁵ For a detailed discussion of the call-loan market see Margaret Myers, *The New York Money Market*, Vol. 1, *Origins and Development*, Chapters 6 and 7. New York: Columbia University Press, 1931; and Joseph Edward Hedges, *Commercial Banking and the Stock Market before 1863*, Chapters 3 to 6. Baltimore: The Johns Hopkins Press, 1938.

bankers' balances and the operations on the stock market were strongly felt in this period, no successful remedy was achieved. When country banks required large funds for the seasonal needs of an agricultural nation, they placed a demand on New York. To meet these wants the New York bankers and brokers called their loans. Securities were forced on the market and prices declined. As the deposits grew and call loans expanded, the manifestations of this weakness became more marked. The crises in the decade 1850 to 1860 occasioned much criticism of the call-loan market. It was accused of attracting funds from other activities and regions and encouraging stock market speculations. After the crisis of 1857 reformers sought to reduce the connection between bank reserves and call loans. None of the changes proposed, however, brought any significant result and the importance of the call-loan market grew. The mechanism that helped to develop the New York Stock Exchange also contributed to the instability of the market.

Although there were no specialized houses for the man with funds to consult concerning his investments, there were firms that performed this function along with many others. A well-informed, retired merchant might devote his energies to studying the security market as he transferred his capital from trade to stocks and bonds. In the ranks of rich men of New York were several who devoted the knowledge and judgment acquired in commerce to enlarging their fortunes in this new avenue of profit. On the other hand, some of them depended heavily on the advice of private bankers and sent discretionary orders for purchase or sale through these channels so as to gain the advantage of an opinion nearer the market before the orders were given to a broker. Others preferred to pass the whole matter of decision over to a trusted house or individual. John P. Cushing, a retired China merchant, for example, entrusted the management of his investments to his friend, William Sturgis of Boston.³⁶

Commercial Credit Market in the United States

Developments in the field of short-term credit paralleled those in long-term operations. In addition to the facilities granted by banks, mercantile credit played its part in the provision of working capital for the wholesaler, retailer, and other businessmen. Terms differed with the trade, locality, and date, but throughout these years payments were postponed for a relatively long time. A wholesaler in Cincinnati might obtain credit in an Eastern city for 6 months or more and gain protracted extensions. In turn, he might grant the retailer from 6 to 12 months' credit. New England manufacturers gave their customers

³⁶ See "John P. Cushing as an Investor, 1828-1862," in N. S. B. Gras and Henrietta M. Larson, *Casebook in American Business History*, pp. 119 ff. New York: F. S. Crofts & Company, 1939.

from 2 to 12 months to pay; later the terms were shortened to 60 or 90 days and some buyers were eager to take advantage of cash discounts.³⁷

This mercantile credit was significant in volume, and in periods of crises collections were difficult to make. Usually the length of credit was shortened after such an experience and in general the time allowed was lessened as transportation and communication improved.

As the volume of credit spread over an expanding area, specialized agencies were needed to gather information on which to base decisions as to the merit of various merchants. Early in the century each importer and wholesaler whose volume of business was appreciable sent agents to tour the country, visit customers, make collections, and judge the standing of those to whom their firms were extending credit. Their reports were long, comprehensive, and often very discerning. The agents of foreign firms, in turn, examined the position of the importers and sent elaborate credit ratings to their houses in Europe. This confidential information was in some cases shared with a few others, but there was a considerable duplication of effort in the gathering of material. It was natural that out of credit analyses of innumerable firms a specialized service should grow. From the experience gained by a New York dry goods firm, Arthur Tappan & Company, Lewis Tappan organized The Mercantile Agency in 1841, to collect and disseminate information on the standing of business houses. In 1854 Robert Graham Dun joined the firm. Branch offices were opened in Eastern cities in the 1840's and by 1857 the house had expanded to London and Montreal as well as to the South and growing West. Another credit agency originated in St. Louis, where John M. Bradstreet, a dry goods merchant and lawyer, had begun to sell his credit information to others. In 1855 Bradstreet's Improved Commercial Agency was set up in New York and the two original components of a well-known credit rating agency were well established.³⁸

Commercial credit, although it sometimes took the form of book credit, was often arranged by promissory notes or domestic bills of exchange. Mere entry of accounts receivable on the books of the seller did not give rise to a negotiable instrument. A wholesaler who received a promise to pay signed by the debtor held an evidence of debt that could be discounted to pay the manufacturer or importer before its date of maturity. In some cases the creditor drew on the debtor and these drafts or bills of exchange when accepted by the drawee were

³⁷ See Fred Mitchell Jones, *Middlemen in the Domestic Trade of the United States, 1800-1860*, pp. 17-18. Urbana: University of Illinois, 1937; Lewis Atherton, *The Pioneer Merchant in Mid-America*, p. 113. Columbia: *The University of Missouri Studies*, Vol. XIV, No. 2, April 1, 1939; Roy A. Foulke, *The Sinews of American Commerce*, pp. 101-114, 153-156. New York: Dun & Bradstreet, Inc., 1941.

³⁸ Roy A. Foulke, *The Sinews of American Commerce*, pp. 283-297. New York: Dun & Bradstreet, Inc., 1941.

likewise negotiable. A draft drawn by a Southern planter on a firm in the North that purchased his cotton illustrates one device for obtaining advance payment. In like manner manufacturers in New England drew on their agents in New York and Western commission agents drew on buyers of wheat and cattle in the East. Time drafts drawn on a reliable purchaser could be discounted; the seller received funds and yet the date of payment was postponed for the purchaser. Both promissory notes and bills of exchange varied in the length of time that they had to run; usually the terms ranged from ten days to six months.

As business expanded and more commercial paper made its appearance, another financial service was organized. During the eighteenth century the volume of such paper was small and merchants disposed of such negotiable instruments by selling them to other merchants who had money to invest or who wished to remit funds to the locality on which the bills of exchange were drawn. Even before 1800, however, brokers operating in negotiable paper were established in the commercial and financial centers of the Eastern states.

In the first half of the nineteenth century, the field for such operations expanded. Not only was there more business paper in which to operate, but there was more capital to be invested in it. Bill brokers operated in the growing cities of the West as well as in Eastern centers. New York gained leadership and the houses established there served more than a local market. New England with its growing manufacturing community put Boston into second rank in the decade before the War Between the States.

Although some firms made a specialty of this particular financial activity, they usually performed other functions as well. In Boston, Gilmore, Blake & Ward, established in 1850, became one of the leading dealers in commercial paper, but the firm also sold foreign exchange, granted credits on a London merchant banker, and aided in the marketing of securities. Other private bankers combined similar financial functions with their commercial-paper business.

For the most part commercial-paper houses acted as agents. Brokers procured paper, usually promissory notes from importers, wholesalers, and other merchants. They charged those who wished to dispose of the paper a commission that varied from 0.25 to 1 per cent, and undertook to find a person or institution to discount it. Banks, both incorporated and private, often provided the market found by these middlemen in business paper, but merchants with surplus funds, retired businessmen, and others also made discounts. Some firms began to operate on their own account and quoted rates for commercial paper; they were willing to assume the risk and responsibility of finding a market for their purchases.

As this discount market evolved, it became better systematized. By

the 1830's rates on commercial paper were being quoted in the financial periodicals of the leading cities. In the decade before the War Between the States, the market in New York was well developed. Paper was classified according to a regular system and discounts for different types of paper were quoted at rates that fluctuated only with changes in the conditions of the money market.³⁹

Intermediary Financial Institutions

There were other types of middlemen in the capital market. In addition to commercial banks, several other institutions acted as reservoirs for funds, accepting money from a large number of individuals and investing it in short-term credits or securities. Among these firms were the savings banks, which grew in number and the size of their deposits. The first mutual savings bank in the country, The Philadelphia Savings Funds Society, was established in 1816, the same year in which the Provident Institution for Savings in Boston was chartered. By 1860 deposits in these and similar banks totaled \$150,000,000. These funds flowed indirectly into credits for business, loans on mortgages, and securities. As the activities of these firms increased, the states passed general laws governing the investment of their funds. Massachusetts in 1834 put a limit of \$1,000 on a deposit by an individual in one bank and stipulated that annual financial statements should be made.⁴⁰

Trust companies developed and usually took larger sums for investment. Although in most cases before 1850 contractual interest was paid on trust deposits, in some instances funds were kept separately and invested for an individual. The Massachusetts Hospital Life Insurance Company, established in 1818, at first followed another practice. The beneficiary did not receive income from the specific trust property, but his share of the income derived from all the funds of the company, in a manner similar to the policy of the modern investment trust. As the financial affairs of corporations became more complex, the trust companies also developed agency functions, paid dividends and interest, and in other ways served corporations.⁴¹

Insurance companies accumulated funds available for investment. By 1841 there were 131 domestic mutual and stock fire and marine insurance companies that not only sold insurance but granted short-term loans on promissory notes or mortgages. Life insurance got its real start early in the nineteenth century. The Pennsylvania Company

³⁹ Albert O. Greef, *The Commercial Paper House in the United States*, pp. 3-37. Cambridge: Harvard University Press, 1938.

⁴⁰ Franklin J. Sherman, *Modern Story of Mutual Savings Banks*, pp. 49, 55, 69. New York: J. J. Little & Ives, 1934. Roy A. Foulke, *The Sinews of American Commerce*, p. 178. New York: Dun & Bradstreet, Inc., 1941.

⁴¹ James G. Smith, *The Development of Trust Companies in the United States*, pp. 239-246, 273, 276, 290-291, 316. New York: Henry Holt and Company, 1928.

for Insurance on Lives and Granting Annuities was chartered in 1812. New companies were organized and such institutions as the Massachusetts Hospital Life Insurance Company, and the New York Life Insurance and Trust Company brought together an increasing volume of funds that was invested in securities, loans on collateral and mortgages on real estate.⁴²

Conclusion

While the foregoing changes in the capital markets were taking place, many events, political and economic, foreign and domestic, had exerted a disturbing influence. Strained national and international relations and exchanges had complicated dealings between creditors and debtors. Changes in the tariff, the struggle over the Second Bank of the United States, the establishment of the Independent Treasury—these and minor events agitated the business world. In the 1850's the flow of gold from California added a new feature to be considered, and uncertainty was increased by the disturbed political conditions of that decade. During the period 1789 to 1860, several crises and ensuing periods of depression occurred. At such times the weaknesses in the financial system were widely discussed. Caught in the current, many men and firms failed, and even the successful struggled through many stormy years.

The opportunities offered during the first 70 years of national life, however, had induced the development of the capital markets. The nation continued to depend on the importation of capital from Europe, but financial facilities in the United States had been expanded. Many cities had played their part in providing enterprises in their vicinities with credit institutions, and New York had developed into a national financial center. The issue of stocks and bonds had become an important means of bringing together large amounts of capital. Security markets had been organized and their volume of business had grown. Commercial credits had been increased. Specialists had emerged to deal in domestic bills of exchange and promissory notes. Intermediary institutions had appeared to serve those who only indirectly invested savings in long-term or short-term loans. Several types of firms had evolved to serve special needs; in the years that followed, many were to build on the houses founded and the techniques developed during these formative years.

In the period before 1860 the growth of the capital markets had aided in the development of the nation. Facilitated by the new methods, the flow of funds had made possible the building of canals and railroads

⁴²Roy A. Foulke, *The Sinews of American Commerce*, pp. 122 ff. and 162 ff. New York: Dun & Bradstreet, Inc., 1941. J. Owen Stalson, *Marketing Life Insurance, Its History in America*, pp. 46-49, 285-286. Cambridge, Mass.: Harvard University Press, 1942.

and the development of banking. Both export and import trade had been increased. Internal trade, expanding with the opening of Western areas and a growing population, had been financed. Funds had been supplied for new manufacturing enterprises. In the rapid growth of the United States credit already had played a dynamic role.

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CHAPTER 15

Business Organization and the Development of an Industrial Discipline

The Day of the Merchant

IN THE UNITED STATES in 1790 business was organized and business activities generally were conducted in the fashion that had been traditional in Europe for centuries. Business in this country consisted of shipping, brokerage, and wholesale and retail selling. There were but three banks in the United States of 1790, three bridge companies, a handful of insurance associations, and a dozen canal companies.¹ Of several manufacturing enterprises attempted on a factory basis, only one had succeeded. There was no labor force skilled in handling machinery, nor any executives experienced in managing complex business structures. Lack of inland transportation, save on occasional rivers, confined the market to the Seaboard cities, and left the farmers of the interior largely self-sufficient. The city merchant was the typical business figure. From a small shop in downtown Boston, New York, Philadelphia, or Baltimore he carried on both wholesale and retail trade in various commodities, receiving his wares from and dispatching them to all parts of the world. Since he stayed in his office directing his agents, supercargoes, and ship captains, letting buyers come to him, he has been called the "sedentary" or "resident" merchant.

By 1860 American business had assumed almost all the varied forms and functions that we are familiar with in the twentieth century. Great railroad, telegraph, shipping, and canal companies employing thousands of men maintained metropolitan offices with scores of clerks, copyists, accountants, and executives. Banks and insurance companies had imposing buildings in every city. A thousand traveling salesmen drummed the wares of large factories devoted to textile, iron, leather, hardware, furniture, and many other kinds of manufactures. The modern type of corporation with hundreds or thousands of stockholders was the usual form in transportation, commercial banking, and insurance and had even appeared in some lines of manufacturing. The Industrial Revolution had come to America, and created the modern world of business.

¹ See: Joseph S. Davis, *Essays in the Earlier History of American Corporations*, 2 vols. Cambridge, Mass.: Harvard University Press, 1917.

While the ventures of the eighteenth-century merchants, with their large fleets of ships and their supercargoes buying and selling in all the ports of the seven seas, might be no less complex than modern business dealings, their administrative organizations were simple. A chief clerk and two or three apprentices constituted the entire "central office" staff, and among these the only permanent employee might be the clerk. Field ventures were intrusted to resident agents in foreign ports, to captains, or supercargoes, all of whom generally worked on commission, and could not be considered as part of a permanent hierarchical organization. Many merchants owned their ships, the crews in that case being employees, who should not, however, be classed as part of the mercantile staff, since the owners had no contact with them nor control over them once they had left the home port. Furthermore, in the business of trading in goods, the ship's crews performed only the auxiliary service of transportation.

The supercargo—the usual type of traveling commission agent—was generally a young relative or family friend of the merchant who accompanied the goods in transport and negotiated the necessary exchanges. This post was the best job for one wishing to learn the more important details of the business, and ordinarily it was used by the young man to amass enough capital from his commissions to enter business for himself. Similarly, a bankrupt merchant might recoup his fortune by a voyage or two as a supercargo for one of his more fortunate relatives. This reliance on family connections seems to have rested partly on the fact that honesty and diligence were more indispensable than skill or experience in conducting business thousands of miles away from the home office. But it was also a reflection of the patriarchal character of the prevailing system. Sons were trained to succeed fathers, and places were made for cousins, nephews, and relatives by marriage in preference to outsiders. As Professor Kenneth W. Porter puts it: ²

The Massachusetts mercantile group was apparently, during this period, pretty much of a closed corporation. In the Jackson-Cabot-Lee circle one does not encounter barefoot farm boys, who come to Boston, secure a warehouse job, study nights, get promoted to the countinghouse, become junior partners, and make their fortunes. It was not, nevertheless, impossible for a poor boy to work himself up to the position of an independent merchant, but his route would be by way of the fo'c'sle and quarter deck, and even here his chances would be considerably improved by being at least a distant and poor relative of the shipowner.

New York and Philadelphia business was probably less bound by family ties than Boston business. At all events, the greatest of the sedentary merchants, John Jacob Astor, succeeded in New York without

² See Kenneth W. Porter, *The Jacksons and the Lees* (2 vols.), Vol. I (Cambridge, Mass.: Harvard University Press, 1937), for a good description of the activities of the old style merchants. Reprinted by permission of the President and Fellows of Harvard College.

benefit of any local family connections.³ Astor's differences from the typical merchants of his day, however, may have accounted for his unusual degree of success. After only one or two voyages as an agent, he turned his major attention to the fur trade of the interior, and invested more of his money in New York City real estate than in merchant ships. Yet in other ways his activities were identical with those of Cabots or Lees, Derbys or Willings. Once he was well established, he stayed in his New York countinghouse, dispatching agents to trade in China, Hawaii, the Pacific Northwest, South America, and Mediterranean ports, as well as to gather furs from around the Great Lakes.

Typical also of the great merchant of the early nineteenth century was Astor's range of activities. He was a leader in the chartering of the Second Bank of the United States, and he became one of its directors as well as president of the New York branch. He owned the principal theater in New York, and later built the city's largest hotel. Retiring from active business in the early 1830's, he devoted the last dozen years of his long life to finance: buying and selling bonds, making loans, and acquiring more and more New York City real estate. It was this last field more than any other that helped him to accumulate \$25,000,000 by the time of his death in 1846, more than twice the amount of capital that any American had so far amassed.

Never in all of Astor's extensive activities had he personally organized a large office or labor force, and the same was true of his great contemporaries. The conditions of the business seemed to have placed distinct limits on the expansion of the individual firm. Keen competition, due to the small amount of capital necessary to enter into trading ventures, kept profits reasonably low, and frequent failures made the successful merchant fearful of delegating responsibility. There was a time, to be sure, from about 1790 until 1807 when the rate of profit was steadily high, perhaps as much as 15 to 20 per cent a year for the abler operators, and it seemed as though some great houses like those of Girard, Astor, Derby, Gray, or Perkins might develop and perpetuate dominant positions in ship owning and foreign trade. But at the very peak of the movement, Government policies—trade restrictions, war, and tariffs—and after 1815 the rise of peacetime foreign competition put a deadly pressure on the rate of profit. One after another, between 1812 and 1830, the bigger houses abandoned world trading and shifted their capital to internal ventures such as banking, transportation, acquiring of Western land, and manufacturing. Thus the most successful sedentary merchants became manufacturers or financiers without ever having trained junior executives to assume part of the responsibility or

³ Kenneth W. Porter, *John Jacob Astor* (2 vols.) (Cambridge, Mass.: Harvard University Press, 1931), is the best business biography in this period.

having built up any great commercial organizations like the India companies of Europe. As railroad executives or manufacturers, they had to learn to handle the problems of large-scale management from the ground up.

The Rise of the Corporation

Partnerships, such as these old mercantile firms, were simple contracts governed by the common law. No partner might dispose of his holdings without the consent of all of the others and the death of any one of them terminated the whole agreement. Offsetting these inflexibilities in ownership, however, was the power of each partner to speak or make contracts for the firm, to handle the company business as simply as though it were his own.

Investments in shipping, trading, or small-scale manufacturing were regularly made on the basis of partnership agreements subscribed to because of faith in the other men involved, and usually the ability to keep an eye on what went on. The joint-stock company with its transferable securities or the corporation with its specially chartered privileges seldom appeared in American mercantile ventures. But new enterprises brought the need for new business forms. The capital necessary for large-scale operations in Western land, turnpike, and canal companies made it necessary to go beyond the immediate locality for financing, and to seek investors who, being busy elsewhere, required the protection afforded by a governing board and freely salable shares of stock. The success of the joint-stock company in attracting the capital of merchants into large ventures gradually made it popular for small manufacturing operations as well. Even when only six or eight local capitalists were associated in an enterprise flexibility both as to size and ownership was assured by setting it up as a company rather than a partnership.

Several factors led to the increasing use of the chartered corporation rather than the joint-stock company in the second and third decades of the nineteenth century. The risks of manufacturing on the factory scale in America made the advantage of limited liability, when it could be secured by a charter, a great help in raising capital.⁴ Turnpikes, canals, and railroads required increasingly large amounts of capital. To raise these sums, low par-value shares were offered in appeals to hundreds or even thousands of small investors who would not risk their money in distant enterprises unless protected against unlimited assessments. Furthermore, these ventures and many others such as bridge,

⁴ New York led the way by an act of 1822 in the establishment of limited partnerships. The limited partners took no part in management, and incurred no risks beyond the cost of their shares. But the ordinary rules of partnership governed withdrawal from the agreement. Connecticut soon passed a similar law,

power, and water supply companies had to have franchises for the use of public property.

Consequently, the wave of corporate business rose steadily, in spite of the many difficulties accompanying incorporation by special act. To get a charter passed by the state legislature involved delays, lobbying expenses, and possible exposure to public attack by journalists and politicians. It cost Colonel Neilson and other promoters of the Delaware and Raritan Canal Company, for example, \$3,100 and two years of work to get a charter from the New Jersey Legislature. Special acts might have, of course, some compensating advantages. Skillful legal arrangements or wise expenditure of money often won the company special rights or privileges. Railroads like the Boston and Lowell, and the Camden and Amboy were granted monopoly privileges, while Southern lines like the New Orleans and Carrollton were allowed to issue paper money and conduct banking businesses.⁵

Two distinct concepts spurred the movement for general incorporation acts. Laws like that enacted by New York in 1811 for the incorporation of certain kinds of manufacturing concerns with less than \$100,000 capital, or by Connecticut in 1817 and Massachusetts in 1830 granting limited liability, were passed to encourage incorporation. The later wave of general incorporation acts after the panic of 1837 and the long depression that followed was inspired more by the fear that corporations were gaining too many dangerous privileges through special acts. Led by Connecticut in 1837, Maryland, New Jersey, New York, Pennsylvania, Indiana, Massachusetts, and Virginia all passed some type of general incorporation statute before the War Between the States. In all cases save those of Connecticut and Virginia, the laws had certain restrictions as to types of companies not found in modern general acts, but they were all alike in striving to bring about uniformity and to protect the public from special privileges in the establishment of corporations. Yet the ease of incorporation under these laws was in the long run a great stimulus to "big" business and the increasing use of the corporate form of organization.

The rise of the large corporation introduced a division between ownership and control that had not existed in the partnership or small company. The old conception of the capitalist-promoter as the man who ventured his money and energies, and, if successful, took the rewards no longer applied. When the directors—those who made the business decisions—held but little stock in the company they were inevitably risking "other people's money" more than their own, while the larger group that had ventured their savings had no direct control over the conduct of the

⁵ See: F. A. Cleveland and F. W. Powell, *Railroad Promotion and Capitalization*. New York: Longmans, Green and Company, 1909.

business. This form of organization, minority ownership by the directors, has been called by Berle and Means the "modern" corporation.⁶ It first appeared in America with the establishment of banks at the close of the Revolution. The Bank of North America, the Bank of New York, the Massachusetts Bank, and the First Bank of the United States were all "modern" corporations. The large amount of capital required for transportation enterprises produced a division between ownership and control from the start, but not until the later 1820's did it appear in manufacturing, where investments were smaller and dependence on skillful management greater. As this type of corporation spread in the thirties and forties, and as examples of occasional mismanagement by directors whose own fortunes were not deeply involved were brought to light, economic thinkers became disturbed by the situation. Even Nathan Appleton, himself one of the greatest directors of "modern" corporations, wrote in 1841:

There is, in the nature of things, greater danger of mismanagement in such an institution, where the interest of the managers is comparatively small, than in institutions of less capital immediately under the direction of parties more deeply interested.

The capital needs of transportation companies brought state participation in business organization. Few such pioneer enterprises seemed possible without substantial state, county, or municipal purchases of stocks and bonds. The credit of the state was generally substituted in part for that of the private company by issuance of state bonds and use of the proceeds to buy the company's securities. The states in this way piled up debts of \$100,000,000 for the benefit of railroad and canal companies during the twenties and thirties, and new Western states repeated the process in the fifties. In a few instances transportation systems were constructed by the states themselves and operated under state ownership. New York by 1825 had finished the Erie Canal at a cost of nearly \$8,500,000; Pennsylvania by 1834 had built a rival canal, rail, and cable system from Philadelphia to Pittsburgh at a cost of more than \$33,000,000. The problem of crossing the southern Appalachians was finally solved in 1851 by the Western and Atlantic Railroad, owned by the state of Georgia. The determining factor leading to state enterprise in all of these cases seems to have been high initial costs in relation to expectations of an immediate, profitable return.

Free and secret transferability of corporate ownership encouraged grave abuses on the part of unscrupulous financiers. It was possible for managing groups to profit personally by ruining great companies and then selling out before the situation became known. Daniel Drew

⁶ A. A. Berle and G. C. Means, *The Modern Corporation and Private Property*. New York: The Macmillan Company, 1932.

was perhaps the outstanding example of this kind of "entrepreneur" in the period before the War Between the States. He bought and sold, built up or ruined properties solely for the purpose of extracting the maximum personal gain. But in the long run the more conscientious men, who mixed pride in productive efficiency with the quest for wealth, were better rewarded. Cornelius Vanderbilt, Nathan Appleton, and Erastus Corning all branched out from the successful conduct of one enterprise to the control of many through strategic stock ownership.

The best-known of this trio of great entrepreneurs is Vanderbilt, who amassed the largest fortune, but much of whose fame and wealth rest on his railroad activities following the War Between the States.⁷ Never a pioneer in new industries, he had a keen sense of when to interest himself in a company, and when to sell out. Specializing first in steamboat and steamship lines, his basic principle seems to have been either to establish a monopoly or sell control to someone who could. One of the great competitors, his aim was always to eliminate competition. So successful was he in bringing competitive pressure against the Government-subsidized steamship lines between New York and San Francisco that after 1856 they paid him first \$40,000 and later \$56,000 a month not to engage in the business. He boasted that if he couldn't operate a steamboat line 20 per cent cheaper than a competitor, he would get out of the business, and that he averaged 25 per cent a year on his investments. Abandoning the shipping business for railroading during the War Between the States, he put together the New York Central system from New York to Chicago, and in the course of the operations increased his fortune from perhaps \$20,000,000 to \$100,000,000.

Nathan Appleton illustrates most clearly the possibilities of widespread influence opened to the financier by the modern corporation. Turning from mercantile pursuits in 1813, Appleton, together with some of the Lowells and Jacksons, put his capital into large-scale textile manufacture. As the efficiently run business prospered the profits were invested in new textile companies, and many other forms of enterprise. Appleton came to be looked upon as the business leader of Massachusetts, sometimes sitting in Congress, at other times coaching Daniel Webster to look after his interests, and always writing and lecturing on the value of the protective tariff and sound banking. By 1840 he and his Boston associates had created in eastern Massachusetts a miniature of the corporate industrial society of the twentieth century. They controlled banking, railroad, insurance, and power companies, as well as great textile mills scattered all over the state.⁸ It was the large "mod-

⁷ See Wheaton J. Lane, *Commodore Vanderbilt*. New York: Alfred A. Knopf, Inc., 1942.

⁸ See Vera Shlakman, *Economic History of a Factory Town*. Northampton: Smith College, 1935.

ern" corporation controllable by strategically organized blocs of shares, and virtually self-perpetuating boards of directors that made this concentration of power possible, but it must be remembered that it was also this device for gathering together the savings of thousands of small investors that had produced the great development.

Management and Labor

The merchant, the master worker, or the owner of the small mill or foundry was scarcely conscious of "management" as a separate task. There was no managerial hierarchy or managerial departmentalization beyond the distinction between laborers, overseers, and clerks, and more often than not the books were kept by the proprietor.⁹ Only on ocean-going ships was there a truly hierarchical business organization, and there the captain rather than the merchant was in charge. The captain faced many of the personnel problems of modern management, but the traditional rules of the sea and the routine nature of most of the tasks made his job a relatively simple one. Even at this early date, however, success in trade probably depended more on the choice of able captain-managers than on any other single element, and it was here that the great merchants like Astor, Girard, Derby, and Gray showed their executive ability.

The growth of the large company between 1790 and 1860 brought with it the necessity for more complex structure in management. Expansion gradually forced canal, railroad, and even large manufacturing companies to departmentalize their staffs. The chief executive came to have less contact with actual operations, and more frequent relations with lesser officers, clerks, and foremen. Usually these trends were resisted both by presidents and directors, and many large mills employing hundreds of workers were run with negligible office forces. As late as 1851 the Eastern and Portland Railroad out of Boston, one of the chief suburban lines, employed only one clerk. But some of the new forms of business already demanded large office staffs. The Delaware and Hudson Canal Company, for instance, required a whole building in New York City to house the administrative force that controlled its 4,200 employees. Banks and insurance companies needed relatively large numbers of white-collar workers and junior executives. As early as 1814 the Massachusetts Bank had, besides a president and vice-president, nine employees, ranging from cashier to assistant clerk.

The supply of new executives for these growing enterprises came not only from the existing mercantile class, but also from the agricultural yeomanry, the skilled hand workers, and the successful small operators. When, for example, Zadoc Pratt decided to establish his great tannery at Pottsville, New York, in 1824, he recruited his labor from the sur-

⁹ See Robert G. Albion, *The Rise of New York Port*. New York: Charles Scribner's Sons, 1939.

rounding countryside, and hired the owner of a small tannery at Northampton, Massachusetts, to serve as manager. As managerial positions multiplied rapidly with the spread of banking, insurance, manufacturing, and transportation, the development gave to our whole business society a dynamic and optimistic aspect. The new superintendents, agents, cashiers, and even clerks had skills that commanded good pay. Compared to laborers or most farmers, they could be called "high-level consumers." This new consumer demand stimulated the growth of service industries such as newspapers, theaters, large retail stores, and the passenger business of rail and boat lines that, in turn, provided still more administrative jobs. In prosperous times, positions multiplied more rapidly than the supply of men of proved ability to fill them. Hence, advancement was rapid and fairly certain for industrious men with the right qualifications.

Within the new companies, even as late as 1860, managerial problems were solved simply by experience or rule of thumb. No books had yet analyzed the functions of the executive, personnel management, or staff and line co-ordination. Yet, as the organizations were small enough for effective one-man supervision, results were, on the whole, tolerably satisfactory. Dr. J. S. Davis, to be sure, thinks that the failure of most of our early manufacturing establishments may have been due to weaknesses in management; but once the pioneering stage was passed and certain lessons had been learned, American industry seems to have been well run. A good president in almost any company could keep track of all branches of the business and know all the lesser administrators and even the older workmen. Thus, there was a natural co-ordination of departments and functions that has been duplicated in modern big business only, if at all, by careful study reinforced by psychological and efficiency-engineering techniques.

Fully as scarce in 1800 as competent executives were properly skilled workers. At that time there was only a handful of shops in the whole country using any kind of complicated machine processes. But when trade difficulties and eventual war with England between 1807 and 1815 cut off imports, hand workers and farmers had to become skilled mechanics. The transition has never been easy, either in America or elsewhere. Not until 1814 was there a power loom in this country, and one constructed then by F. C. Lowell cost more than four times as much as the contemporary Scottish models. Yet, every one of the hundreds of factories that sprang up during these years needed machinery and skilled mechanics.¹⁰ Foreign technicians, good, bad, or indifferent, sold their services at a premium, and firms employing such workers adver-

¹⁰ See: Arthur H. Cole, *The American Wool Manufacture*, 2 vols. Cambridge: Harvard University Press, 1926. Arthur H. Cole and Harold F. Williamson, *The American Carpet Manufacture*. Cambridge: Harvard University Press, 1941. Caroline F. Ware, *The Early New England Cotton Manufacture*. New York: Houghton, Mifflin Company, 1931.

tised the fact as a guarantee of the quality of their products. Not until the 1830's, when a new generation familiar with machinery had grown up, and more foreign workers had developed the habit of seeking their fortunes in America, did the skilled labor supply begin to catch up with the demand.

The early railroads, in particular, suffered from lack of both skilled workers and executives. Safe and efficient railroading depends upon a high level of reliability that comes only with experience and the development of traditional routines. The switchman must realize that hundreds of lives depend upon his continuous vigilance; the men responsible for train dispatching must keep in mind that there can be no mix-ups in their orders; maintenance men must understand that they cannot afford to take chances with slightly weak equipment. The development of all these disciplines and the experience and information necessary to them took time. To one accustomed to the smooth efficiency of railroading in the mid-twentieth century, the annals of the 1830's, forties, and fifties have an unreal, nightmarish quality. Terrific wrecks due to the most elementary errors, and delays of hours or even days because of the simplest kind of carelessness in the upkeep of equipment were common.¹¹ These and similar wastes were endured over and over again as railroads spread continuously to new areas, recruiting employees from among men who had never before been on a train.

Finding unskilled labor for factories and mills, railroad and canal construction was a less difficult problem. While the big textile mills in the New England area had to recruit workers by sending agents with wagons into the back country, the supply of men, women, and children from surrounding farms was adequate for ordinary enterprises. By 1816 cotton manufacturers employed 66,000 women and girls, 24,000 boys, and 10,000 men; and there are no records of business ventures being seriously handicapped by lack of common labor.¹² From the 1830's on, large numbers of Irish and German immigrants swelled the supply of unskilled workers. In the forties and fifties these earlier Europeans were augmented by French Canadians seeking relief from the hard farming conditions of Ontario, Quebec, and the Maritime Provinces. So great was this flood of immigrant labor after 1845 that native workers joined in ineffectual movements to restrict immigration and naturalization. By 1860 more than one-third of the population of New York and one-quarter of the population of Rhode Island and Massachusetts was foreign born.

¹¹ See F. C. B. Bradley, *The Eastern Railroad*. Salem, Mass.: Essex Institute, 1922.

¹² See James L. Bishop, *A History of American Manufacturing from 1608 to 1860* (3 vols.) (Philadelphia: E. Young, 1868), and Victor S. Clark, *History of Manufactures in the United States* (3 vols.) (New York: McGraw-Hill Book Company, 1929).

A large number of German immigrants went into the Western farming areas, but the Irish stayed near the industrial centers, forming a cheap but undisciplined working force.¹³ Riots of Irish stevedores, porters, and construction crews seem to have been frequent. Often, as in 1834, when striking workmen killed several contractors on the Washington railroad, these disturbances led to bloodshed and the calling out of police or militia. In the factories employing large numbers of men, strikes over wages and hours seem to have been frequent during the periods of prosperity. But none of these activities prior to the War Between the States led to any permanent organization of unskilled labor.

The appearance of local trade-unions and central trades councils in the chief industrial cities in the twenties and thirties led immediately to counterorganization by employers. The masters in trades such as printing, shoemaking, building, and tailoring were small operators who in some instances were already members of associations to govern manufacturing and selling practices. The rise of union militancy, particularly during the boom from 1834 to 1837, gave new vitality to the older associations that now added labor relations to their functions. Strikes for the ten-hour day and higher wages to meet the sharp upswing in prices were fought by seven employer's organizations in Philadelphia, and eight in New York. But it was the long depression after 1837, more than employer opposition, that broke the strength of the unions.¹⁴ During the forties increasing mechanization, immigration of skilled workers from Germany and England, and general depression reduced the craft unions to regional organizations for co-operative insurance, education, and social functions. Prosperity in the early fifties brought new militancy and strikes, but once again successful organization was confined to the highly skilled trades. Led by the typographers in 1851, the hatters, stone cutters, locomotive engineers, iron molders, blacksmiths, and machinists had formed national organizations by 1860.

In the factory industries where the employers were stronger, labor remained unorganized. The blacklist from 1829 on, at least, proved a most effective weapon for preventing union activity. No worker, it was said, after dismissal from one of the "boarding house" mills of Massachusetts could get another job in this type of factory. The railroads were able to pursue similar policies through their regional managers' associations. By 1860 virtually every trade in every locality had some kind of association for dealing with labor, but none of them had as yet perfected national organizations equal to those of the strongest trade-unions.

¹³ See Marcus L. Hansen, *The Atlantic Migration, 1607-1860*. Cambridge, Mass.: Harvard University Press, 1940.

¹⁴ John R. Commons and Associates, *History of Labor in the United States*, Vol. I. New York: The Macmillan Company, 1936.

Wage and hour standards were regarded by most employers and many workmen as fixed by the demands of competition. No manager thought of studying the problem of whether shorter hours and better working conditions might lead to greater productivity. If an employer paid the traditional or prevailing rate, and asked for the usual number of hours of labor he was dealing "justly" with his employees. He would, almost without exception, be convinced that any departure from these wage standards in an upward direction would be ruinous, and in some cases, where a truly competitive market existed, he was right. Unless a regional union could enforce equal conditions on all competitors it was dangerous for any individual employer to meet the delegates' demands. Perhaps even more important was the employer's feeling that he could not run his business efficiently if he were "dictated to" by labor leaders outside his plant.¹⁵ Unionism with its demands for fixed arrangements menaced the flexibility in costs and the high degree of managerial opportunism that were necessary factors in competitive success.

Another major reason for the slow growth of both managerial organization and trade-unions was the paternalism of many employers, and the existence in a real form of "personal relations" between the skilled worker and the "big boss." By the 1830's cotton manufacture was the most advanced factory industry, yet there were, on the average, less than a hundred employees per establishment in New York and Massachusetts. Even by 1860 only six industries averaged more than 100 employees per plant, and of these only cotton textiles (with an average of about 120) consisted of many establishments. The McCormick plant in Chicago, the largest agricultural machinery factory, employed 300 workers in the mid-fifties, but it was managed personally by Leander McCormick, Cyrus's brother, and four foremen. The very biggest plants were the marine iron works in New York City employing up to a thousand men, but even here contact between the managing partners and the skilled workers seems to have been fairly close. In the great majority of cases the plant manager was also a heavy investor in the enterprise. Under such conditions he could dispense a sort of compensation insurance out of his own pocket. Knowing the lives of his permanent employees, he could aid them when sickness came or care for them or their families in case of injury. Unconsciously the older workers and the boss entered into semifeudal relations. The workers gave the boss loyal support in his battles with competitors and he in turn regarded them as "his" men.

The pleasant personal relations and working conditions of the owner-

¹⁵ See T. C. Cochran and W. Miller, *The Age of Enterprise*, Chapter XI. New York: The Macmillan Company, 1942.

run plant were, to be sure, not universal. Railroads, shipping, and New England textile manufacture in particular presented pictures of low-paid, overworked operatives who were left to shift for themselves in case of sickness or injury. Top executives in railroad and shipping lines were necessarily out of touch with local "shop" conditions, and the large corporate organization of most Massachusetts cotton mills brought them under the same handicap. In all these industries the dictatorship of the "little boss" or foremen began to assert itself and produce the mixture of evils and occasional benefits that was to present such problems to the big companies of the twentieth century.

The Problems of Competition

The self-sufficient, agricultural society of inland America at the end of the eighteenth century was from the business standpoint largely noncompetitive. As long as transportation was prohibitively expensive, the local gristmill, tannery, sawmill, smithy, or general store represented a regional monopoly. The rapid spread of turnpikes, canals, and railroads in the first decades of the nineteenth century, however, rudely shattered these stabilized business relations in one community after another and ushered in a period of intense competition between local and "outside" products. The cheaper transportation became, the more certain was the conquest of the market by outside factory-made wares; and the broader the market became, the greater were the advantages of mass production. When Zadoc Pratt, for example, invested \$250,000 in "the world's largest tannery" at Pottsville, one may be sure that scores of local tanners in central New York were driven out of business. The rise of Dun's and Bradstreet's mercantile credit agencies after 1840, making it possible safely to extend credit to strange or remote merchants, removed one of the major handicaps to doing business at a distance. Thus, by 1860 local monopoly or duopoly survived chiefly in the selling and service trades such as storekeeping, barbering, horseshoeing, building, or banking.

As new machine processes cut the cost of an article and moved its production from the home or small shop to the factory, a favorable or "sellers'" market would be opened for the product at new low prices that nevertheless paid a high return to the factory owner. Organization of additional manufacturing companies would follow, until the demand for the article was more than supplied and sellers were forced into cutthroat competition. As soon as this situation appeared in any of the mechanized fields, those houses suffering most from the competition invariably took steps to bring it under control. Formation of a trade association similar to those created by the old master workers in the handicrafts was usually the first step. Through this organization attempts were made to fix prices at a point that would allow a profit to

all competitors, and, if possible, to limit production so as to avoid surpluses that would endanger the market. Such co-operation seemed necessary to preserve price stability whenever large amounts of invested capital were at stake in either manufacturing or transportation. One of the earliest trade-association agreements was that of the upper Ohio River steamboat operators in 1818 regulating rates and schedules, but in general the decade of the fifties marked the spread of the large regional or national associations such as The New England Railway Managers Association, The American Brass Association, and The American Iron Association.¹⁶

As written agreements for price fixing or limitation of production fell within the usual common law interpretation of conspiracy in restraint of trade, all bargains rested on verbal or "gentlemen's" agreements that could not be enforced by law. The trouble with such agreements was described by a speaker at a convention of New England railroad executives in 1851:

We make solemn bargains with each other to be governed by certain principles and rules, and violate them the same day, by a secret bargain with an individual, to obtain a small pittance of freight from another road.

As soon as one party started to sell below the price agreed upon, the whole arrangement, of course, broke down. Pooling of goods or traffic and sale through a central agency offered a better guarantee of fair dealing, but the quotas were very difficult to arrange and normally had to be re-negotiated each year. The final solutions, reached even as early as the forties, were either consolidation of the principal firms into a single company or control of the various competing companies by a single stockholder interest. The first type of solution is illustrated by New York Central in the railroad field, Western Union in telegraphy, and the Kanawha River Salt Association in manufacturing; the second type by the enterprises of the "Boston Associates" in Massachusetts, discussed on page 309. But in most cases these final steps were not taken until many years after the War Between the States, and meanwhile "gentlemen's agreements" or pools were made, broken, and remade year after year.

In the railroad field the state governments, by early grants of monopoly privileges, aided the trend away from unlimited competition. The most important of these grants, in the long run, was the agreement by which the New Jersey Legislature accepted stock in the Camden and Amboy Railroad that was to be surrendered if the legislators should ever charter a competing road. This bottleneck in East Coast railroad

¹⁶For early beginnings see Louis Hunter, *Studies in the Economic History of the Ohio Valley* (Northampton: Smith College, 1934); for general discussion, see Cochran and Miller, *Age of Enterprise*, pp. 59-63.

traffic remained unbroken until the needs of the War Between the States made new lines imperative. But in general the important regional railroad monopolies were the result of consolidations promoted by businessmen rather than privileges conferred by state grants. The New York Central, the Illinois Central, and the Pennsylvania systems grew by purchase and merger of smaller roads in the fifties with neither aid nor interference from the states.

Business on the Eve of the War

Within the first 60 years of the nineteenth century a competent industrial labor force had been created from a nation of farmers. National trade-unions had grown up in the most skilled crafts, and from 1859 on there were annual conventions of national trade-union leaders. Rapid immigration to Eastern cities in the two decades before the war provided an abundant supply of unskilled labor, while those immigrants who went West seeking farms broadened the markets for industrial products.

Although business organization as a whole was still regional and small-scale, a railway net stretching from Boston, Charleston, and New Orleans to LaCrosse, Wisconsin, St. Joseph, Missouri, and Wynne, Arkansas, invited mass production for a national market. Some products such as Colt arms, McCormick farm machinery, Baldwin locomotives, Pratt leathers, American screws, or New England textiles already occupied this market, coming by rail and steamboat to distribution centers like Chicago, St. Louis, Memphis, or New Orleans. But the protection afforded by transportation costs and the absence of widespread national advertising preserved the existence of thousands of local enterprises. Most firms sold only in certain natural geographic regions, shipping only limited distances and depending upon consumer satisfaction and local advertising for the spread of their wares. New Jersey and New York were dotted with small iron works that sold locally in competition with Pittsburgh firms, and almost every state had textile mills that held their regional customers against the pressure from New England.

Management had already faced, in embryo form at least, most of the problems of large-scale business organization. The co-ordination of big office staffs had been learned, particularly in finance and transportation, and fixed habits or disciplines were developing among the underlings that made it safe to delegate to them authority over routine matters. While no important fields of production had been monopolized by a single company, managers had experimented with almost all the modern techniques of limited competition. The rise of the "trust" and the railroad "ownership system" in the succeeding decades were already clearly foreshadowed in the trends of Eastern business.

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CHAPTER 16

The Performance of the American Economy Before 1860

AN ECONOMY may be judged by its performance—its record in utilizing the resources at its disposal in the satisfaction of material wants. A critical examination of the performance of the American economy can throw valuable light on the factors that have governed its past behavior and may assist in understanding and solving current problems.

The performance of an economic system is to some extent a consequence of the positive steps that the authorities take in creating or neutralizing disruptive forces. It is not necessary to believe that the Government should, or could, prevent peacetime fluctuations in business activity. But it is not to be denied that the Government can influence such activity for better or for worse. In wartime, moreover, the Government by unanimous consent is entrusted with the task of mobilizing and then demobilizing resources; by appropriate action it can maximize the war effort and mitigate wartime and post-war adjustments. A study of the performance of the American economy will indicate how effective it has been in satisfying both wartime and peacetime needs.¹

In trying to gauge and evaluate its performance, it is necessary to examine the system's record of behavior under ordinary and extraordinary conditions and under the impact of both internal and external shocks; to study the extent to which it has shown wide fluctuations in its ability to satisfy material wants; and to examine its resilience in the face of disruptive forces. It is necessary to go deeper, and try to disentangle the transient adjustments from the permanent, thus disclosing underlying tendencies of long-term development indicative of its ability to perform its functions.

A study of the performance of the American economy may therefore conveniently be broken up into three parts: (1) A consideration of how it has behaved under peacetime conditions—the fluctuations in the national income during prosperity and depression. (2) An analysis of how it has withstood the impact of war—the mobilization of a large part of the national income for military purposes and then reversion to peacetime conditions. (3) An investigation of the trends that have

¹ See W. B. Smith and A. H. Cole, *Fluctuations in American Business: 1790-1860*, p. xxi. Cambridge, Mass.: Harvard University Press, 1935.

been in operation and, perhaps far more cautiously, of the tendencies that may be expected to manifest themselves in the future.

American economic development before 1860 was mainly dependent upon the increasing power of the central Government and the geographical expansion of the country. These two factors controlled the economic fluctuations of the period. Before the Revolutionary War, the separate Colonies possessed their own economic and political organizations, which were tied very closely to those of the motherland. The Revolutionary War reduced somewhat economic dependence on England and strengthened considerably the interdependence of the nation's individual units. It also set up a new political and economic organization, the United States of America, which, as time went by, grew more powerful in its relations both with the individual states and with the rest of the world. Economic independence lagged considerably behind political independence, as the events leading up to the War of 1812 demonstrated so fully. Extension of territory made available vast natural resources and created a demand for facilities and workers to exploit those resources. Manpower, machines, and money were required. The increase of the central Government's power was interrelated with this increase in size of the economy.

Wartime Booms and Post-War Reactions

A period of war necessarily involves serious adjustments in the economic organization of a society, since part of the national income must be diverted to the production of war materials and part of the population must be removed completely from production and placed in the armed forces. The utilization of previously unemployed resources and manpower in the early stages of a war might give the impression that it is possible to have both guns and butter, both soldiers and workers. When a high level of production and employment is attained, however, civilian sacrifices are made more apparent by shifts from civilian to war production or service. Even when the transition from peace to war is effected gradually, some disruption must take place; when it is not carried out gradually, disruption may become so widespread as to resemble chaos. The transition may be made difficult, and the departure from normal conditions may be intensified, by the cessation or curtailment of foreign trade or by harmful fiscal or other economic policies adopted by the government.

In the post-war period problems of adjustment are even more serious because the change is usually made suddenly and proceeds from more hectic economic conditions. The economy is opened up, trade is resumed; meanwhile wartime production becomes obsolete. Yet the fiscal policies of wartime leave their legacy of overexpanded credit and currency. War workers and soldiers must be fitted into civilian production again.

It is not astonishing that severe economic disturbances usually characterize post-war eras. Such wartime booms and post-war reactions were numerous in the period before 1860. John Adams said: "I am old enough to remember the war of 1745 and its end, the war of 1755 and its close, the war of 1775 and its termination, the war of 1812 and its pacification. Every one of these wars has been followed by a general distress, embarrassments of commerce, destruction of manufactures, fall of the price of produce and lands."²

The American Economy During the Revolutionary War: 1775-1783³

The diversion of a large part of the national income to the prosecution of the war with England was extremely onerous for an economically immature and relatively unorganized group of Colonies.⁴ Men, materials, and money were scarce. Lack of men resulted from the small population, division of loyalties, and unsatisfactory methods of recruiting and maintenance. Lack of materials arose from the British blockade, the undeveloped state of the country's manufactures, and the policies adopted to obtain supplies. Lack of money—money that could effectively assist in the prosecution of the war with a minimum of economic disruption—was a consequence of decentralized authority, short-sighted fiscal policies, poor credit standing of the Colonies, and the makeshift central Government. All these factors were, of course, closely connected.

The manpower problem was less acute in fact than it appeared on paper. Considering the population on which England could draw and the force she could and did put into the field, the Colonies were indeed at a serious disadvantage. But England had to watch France and other countries, and had to fight at a great distance from her home base. Moreover, the fact that some of the American armed forces could be engaged in both agricultural and military pursuits at the same time made for a fuller utilization of the available manpower. But the existence of an openly hostile Tory group substantially reduced potential

² Quoted from Willard L. Thorp, *Business Annals*, p. 112. New York: National Bureau of Economic Research, 1926.

³ See: Edmund Cody Burnett, *The Continental Congress*. New York: The Macmillan Company, 1941. Robert A. East, *Business Enterprise in the American Revolutionary Era*. New York: Columbia University Press, 1938. Arthur Meier Schlesinger, *The Colonial Merchants and the American Revolution, 1763-1776*. New York: Columbia University Press, 1918.

⁴ The earlier wars had involved a relatively small economic effort. "Our wars during the first half of the eighteenth century were somewhat desultory, in the nature of intermittent skirmishes in the wilderness. The American Revolutionary War was the first example in our history of a concentrated military effort, involving armies and financial outlay that placed a heavy burden upon the pioneer civilization of that time." Norman J. Silberling, *The Dynamics of Business*, p. 52. New York: McGraw-Hill Book Company, 1943.

manpower. The inadequate provision for the army, and the low and depreciating army pay reduced the size and the effectiveness of the American fighting force.

The problem of obtaining materials might have been fatal had it not been for outside assistance. Because of natural advantage and by specific dictate of the mother country, the Colonies had emphasized agriculture and neglected manufacturing. Consequently, the Colonies were well stocked with food but deficient in clothing and munitions. Fortunately France was willing and able to act as an arsenal of democracy and aid the Colonies in their fight. Also, some leaks were found in the British blockade. But far from the fullest use was made of available resources. The Continental Congress soon found itself unable to obtain supplies and had to call on the separate states, sometimes on private individuals, for assistance. Rivalry, selfishness, and lack of co-ordination combined to reduce efficiency; and sometimes, as in the case of embargoes on exports from one state to another, the different units worked at cross purposes. Further unnecessary confusion resulted from competition among various purchasing units: the Congress, the states, and the various foreign governments. Only after 1781, when some semblance of centralized control of purchasing was attained, did the situation improve. The price policy adopted also reacted unfavorably on the availability of supplies. With the rapidly rising market price level, attempts at price-fixing led to hoarding and even to sales to the enemy. Although some groups of states adopted price conventions, general laxity of enforcement and the irresistible appeal of the printing press soon made shambles of attempts at control; and variations in the degree of enforcement among the various states disrupted the flow of commodities.

Monetary problems were the most spectacular. Lacking the power to tax, the Continental Congress had to depend on its own credit and on the munificence of the states to finance the war. Through foreign loans the Congress was able to raise some money.⁵ But this source of funds soon proved inadequate, and the Congress had to resort to printing-press money to so great an extent that the paper dollar depreciated rapidly in value. The general disinclination to taxation prevalent in the Colonies forced the states likewise to seek help from the printing press. The weak central Government, whose military prowess far exceeded its economic power, seemed to have no alternative. Attempts to enforce legal-tender provisions merely had the effect of driving specie out of circulation. The young economy experienced an upward rush of prices not to be equaled in its most mature years. The general level of wholesale

⁵ Bills of exchange were drawn on France and sold even before the French loans were assured. See Burnett, *The Continental Congress*, pp. 375-377, 419.

prices rose to high points in 1779 and 1780, and then began to fall.⁶

The fiscal problems of the Revolution and the unsatisfactory methods employed to solve them had repercussions throughout the economy.⁷ Uneven effects fell on different groups of people and on different individuals within those groups. Contractual obligations fixed in monetary terms redounded to the advantage of the debtor against the creditor, since the money payment represented a much smaller quantity of goods and of effort than at the time when the obligation was undertaken and prices were lower. Persons with fixed incomes whose monetary earnings changed only slowly, and therefore lagged behind prices, suffered a decline in real income and standard of living. On the other hand, those engaged in selling goods could take advantage of the rise in prices and the lag in costs to earn large profits, and were mainly responsible for the atmosphere of extravagance and luxury that prevailed in some quarters. The price rise reacted back on the governments that had to pay for the war and raised the cost of equipping and maintaining the armed forces. Ultimately, good money in the form of specie brought over by the French and British drove out bad; Gresham's law seemed to reverse itself since the paper money that at first was accepted below par soon was not accepted at all. Since the supply of specie was neither sufficient nor widely distributed, barter replaced monetary transactions in many instances. The successful conclusion of the war owed much to military prowess and considerably less to wisdom of economic policy.

Economic Changes Following the War

The economic changes that followed the Revolutionary War were of two sorts: those that affected general activity and those that affected the distribution of wealth and income among various groups of the population. The first type of change operated in both domestic and foreign trade. The wartime depreciation of the currency and the inflationary rise in prices were followed by a sharp deflation in the post-war period, particularly in 1785 and 1786. The sharp rise in prices caused by the war was matched only by the precipitous fall when peace was proclaimed. During the immediate post-war period, the price system as a whole settled back to its pre-war level. By 1785 wholesale prices had fallen to the level of 1776. Deflation, which thus continued to 1789, discouraged domestic trade and business activity, although business began to recover after 1787. In foreign trade the infant indus-

⁶ See Arthur H. Cole, *Wholesale Commodity Prices in the United States, 1700-1861*. Cambridge, Mass.: Harvard University Press, 1938.

⁷ It should perhaps be pointed out that the desirability of imposing heavy taxes to prevent inflation was generally recognized in enlightened circles. See Burnett, *The Continental Congress*, pp. 376, 408, 417, 424.

tries created by the emergency conditions of the war now lost their artificial protection. Goods of British manufacture flooded the market and depressed business. At the same time the export industries that had been encouraged during the Colonial period now lost their preferential treatment in the British market. Immediate economic advantages of the break with England were not apparent. Although the country had met with military success, the gains on the economic front appeared empty.

A significant redistribution of wealth and income took place within the country and in the economic power of various groups. The confiscation of Tory property effected such redistribution to some extent, but the uneven impact of Government war expenditures and of price changes were of more profound importance. The sharp price rise during the war had favored the debtor classes but the deflation of the post-war period placed at a disadvantage those who had undertaken contractual obligations during the period of high prices. The war had brought with it the inevitable crop of *nouveaux riches*. While some branches of economic activity suffered during the war others benefited from high profits. Some people had won and some had lost on the economic front. In the individual states post-war deflation, particularly in the year 1785-1786, stirred up strong agitation for "easy money." The state governments were subjected to pressure for an increase in the issue of paper money. This pressure was the expression of a popular movement of the debtor classes, mainly rural and agricultural, against the creditor classes, mainly urban. In some cases mob violence broke out, notably in Shays' Rebellion. In many states the governments yielded to the pressure and issued large amounts of paper money that was made legal tender. The fiscal condition of the central Government became worse, if possible, in the post-war period than it had been during the war. Requisitions on the states, sale of public lands, and even loans from abroad provided insufficient funds to meet expenditures. The Confederation Congress even had to default on its interest payments. By the end of the period it was on the verge of insolvency, and a drastic enlargement of the economic powers of the central Government was required.

Economic Activity During the European Wars: 1790-1814^s

Economic activity in the period 1790-1811 showed the effects of war, but no gaping wounds appeared until after 1806. Early in the period, the country gained from the European wars. Production and trade were

^s See Thorp, *Business Annals*, pp. 113-117; and Smith and Cole, *Fluctuations in American Business, 1790-1860*, pp. 3-33.

stimulated.⁹ The situation was similar to that prevailing later in the First World War and the Second World War in the years before this country actually began hostilities.¹⁰ The economy still bore many marks of its Colonial origin; hence it was mainly agriculture and shipping that experienced the higher level of activity.

The Non-Importation Act of 1806 and the Embargo of 1808 put this profitable period to an end.¹¹ The country was cut off from many foreign manufactures, and in turn was restricted in its exports. As a result, commerce, shipping, and agriculture were hard hit. Increased self-sufficiency was the only alternative. Advantages of international specialization were lost. But the development of interregional specialization within the confines of the United States compensated in part for this loss and reduced to some extent this nation's dependence on other countries for the maintenance of its living standards.

The outbreak of the War of 1812 culminated the closing of the American economy. The effects on economic activity within the country were immediate and widespread. The price structure and the structure of industry suffered from internal disorders, with various parts of the economy reacting in widely divergent ways. The cutting off of imports resulted in a sharp increase in the prices of imported goods; prices of domestically produced goods did not immediately rise, and when they did finally respond to increased demand and higher costs of production and transportation, they did not rise as high as the prices of imported goods.

Manufacturing experienced a most favorable reaction, since it was necessary to supplant the imported goods that were cut off. On the other hand, agricultural production, shipping, and commerce suffered because of the cutting down of imports. The effectiveness of the British blockade was felt even by coastwise trade.

These structural changes in prices and production were accompanied and to some extent fostered by a great expansion in the field of money and banking. The increased banking activity may be traced to several causes, notable among which were Government deposits in private banks following the closing of the First Bank of the United States in 1811.

⁹ The merchant tonnage more than doubled between 1793 and 1805. See Vernon G. Setser, *The Commercial Reciprocity Policy of the United States, 1774-1829*, p. 161. Philadelphia: University of Pennsylvania Press, 1937.

¹⁰ Also a considerable amount of speculative activity in 1791 and 1792 followed the success of Hamilton's funding plan for the national debt. See Richard Brandon Morris, *Historiography of America 1600-1800*, p. 13 (New York: Columbia University Press, 1933); Margaret G. Myers, *The New York Money Market*, Vol. I, p. 12 (New York: Columbia University Press, 1931); and Joseph Stancliffe Davis, *Essays in the Early History of American Corporations*, pp. 332 ff. (Cambridge, Mass.: Harvard University Press, 1917).

¹¹ For an extremely interesting account of this period the reader is referred to Herbert Heaton, "Non-Importation, 1806-1812," *The Journal of Economic History*, November, 1941, Vol. I, pp. 178-198.

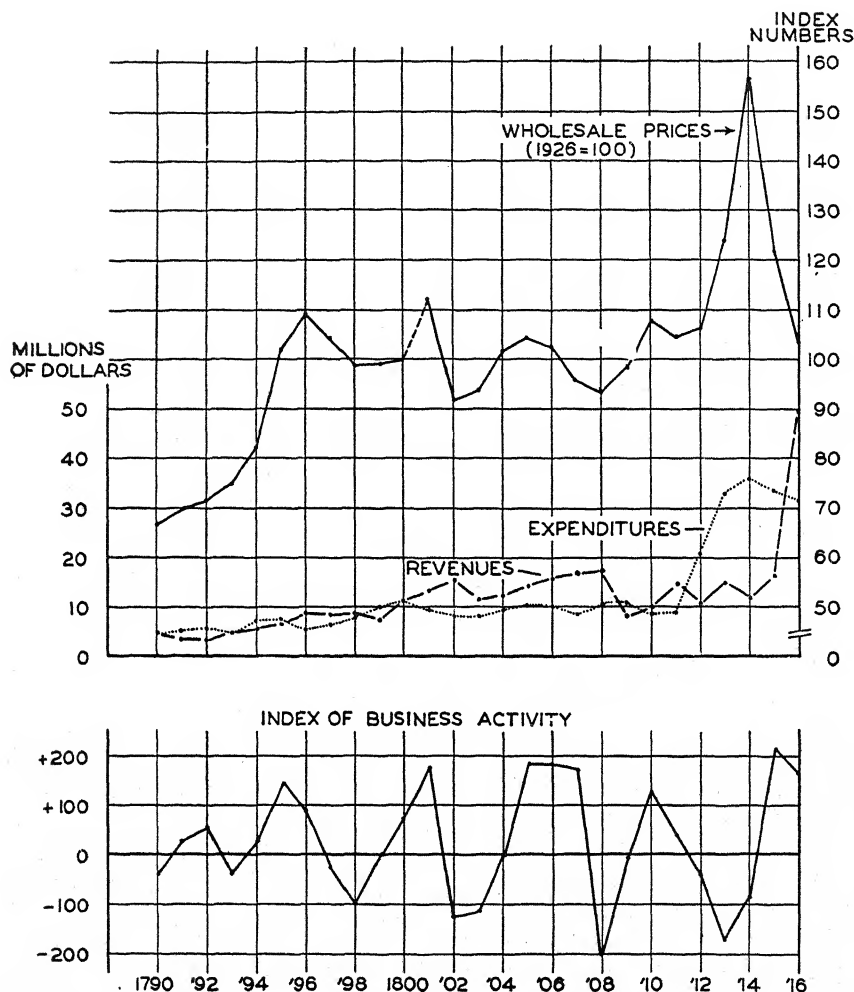


FIG. 1. Fiscal Policy and Business Activity: 1790-1816. (Note: The fiscal year is the same as the calendar year in this period.) Sources: "Expenditures" and "Revenues," United States Treasury Department (*Annual Report of the Secretary of the Treasury*, 1937, pp. 346-349); "Wholesale Prices," 1801-1816, United States Bureau of Labor Statistics (Jesse M. Cutts, "One Hundred and Thirty-Four Years of Wholesale Prices," *Monthly Labor Review*, July, 1935); "Wholesale Prices," 1790-1806, based on Bezanson, Gray, and Hussey, *Wholesale Prices in Philadelphia, 1784-1861*, Vol. I, p. 392 (Philadelphia, 1936); "Business Activity" based on Cleveland Trust Company monthly index.

The needs of war, imposing a great increase in Government borrowing, also promoted financial expansion. Government expenditures rose from \$8,560,000 in fiscal 1811 to a high of \$35,450,000 in 1814. Revenues fluctuated within the range \$10,000,000 to \$15,000,000.¹² The result

¹² U. S. Treasury Department, *Annual Report of the Secretary of the Treasury*, 1937, pp. 346-349.

was an excessive credit expansion, the growth of reckless banking methods, and, in many cases, the suspension of specie payments. Except in New England, the banks had overextended themselves again. The war was relatively a short one, however, and the price increase was not comparable to that of the Revolutionary period. The general price level fell from a high point in 1805 to a low in 1808, and then rose unevenly to a peak in 1814.

Post-War Readjustments¹³

With the War of 1812 the United States of America had experienced its first major shock. Considering the country's dependence on foreign trade and the instability of its financial structure, it is perhaps no exaggeration to say that the shock was greater in relative terms than it has ever experienced since that time. The depression of agriculture, shipping, and commerce, the expansion of manufacturing output, and the rise of prices left their mark. The end of the war opened up the economy again and upset the price relations established during the struggle. Prices of imported goods fell sharply, while prices of domestically produced goods continued high until 1817, owing to the sustained European demand for foodstuffs. Both dropped, however, with the panic of 1818-1819 and reached the low level that had prevailed before the outbreak of the European War in 1792. The hopeless situation that beset banking by the end of the war reached a breaking point. Provision was finally made for a new Bank of the United States, which was to have a 20-year lease on life from 1816 to 1836. Lagging Government revenues finally caught up with and overtook expenditures in 1816, when revenues were \$48,490,000 and expenditures \$31,390,000.¹⁴ The general level of wholesale prices fell from a high point in 1814 and continued downward for some years. The usual pattern of wartime boom and post-war reaction had reasserted itself.

The open nature of the American economy, the weakness of the central Government, and its unwillingness to impose strong fiscal and other measures led to wide wartime and post-war fluctuations in the period to 1860. The wartime booms were of an extremely mixed variety with far greater sectors suffering sharp curtailment than is true today. This difference is attributable to the greater dependence on foreign trade that existed at that time. The wartime difficulties might still have been mitigated if more effective measures had been pursued to divert depressed industries and workers to war production and service. But the

¹³ See Thorp, *Business Annals*, pp. 117-118; and Smith and Cole, *Fluctuations in American Business, 1790-1860*, pp. 3-33.

¹⁴ U. S. Treasury Department, *Annual Report of the Secretary of the Treasury, 1937*, pp. 346-349.

measures taken frequently defeated their purpose and the fiscal methods adopted interposed the additional disruptive factor of rapid fluctuations in price levels.

The post-war reactions were allowed to run their course with virtually unbridled severity. Foresight was lacking in bridging the transition from war to peace. The sudden resumption of foreign trade, the sudden cessation of demand for military supplies, the sudden release of soldiers and war workers inflicted an even greater shock than war itself. The post-war maladjustments in business activity and employment might have been prevented, partly if not wholly, by adequate planning designed to swing the economy gradually back onto a peacetime basis.

Peacetime Crises and Cycles

From the earliest settlements, this country has experienced peacetime economic fluctuations.¹⁵ In the period before the War Between the States, these fluctuations may be traced mainly to agriculture, which was influenced primarily by world conditions, including wars in Europe. Dependent as the country was on the product of the soil, it is not astonishing that its economic fluctuations stemmed partly from agricultural variations. Periodic changes in demand—perhaps because of war—or supply—perhaps because of drought—led to violent fluctuations in price and resulted in further changes in supply. The rapid growth of the economy coupled with monetary instability completed the environmental conditions conducive to wide swings in business activity. In Colonial days, particularly, the peacetime fluctuations of the economy were exogenous in nature. Only in the later period of nationalistic development did crises and cycles of internal origin become evident. Until some time after the War of 1812, the influence of domestic and foreign wars was so great that it seems best to restrict the discussion of *peacetime* crises and cycles to the period 1817–1860.

During this period many internal changes made the United States more sensitive to disruptive forces. The extension of resources through the development of the West took place so rapidly and was generally accompanied by such boom conditions that the rate of change here exceeded that of other parts of the economic system. Maladjustments inevitably arose when different parts of the economy were progressing at different rates. Speculation was rife in Western lands. Every so often the economy, stopping to catch its breath, so to speak, burst the speculative bubble. The resulting reaction on the whole economic organization often precipitated a general crisis. Another sensitive feature was the heavy capital investment in specialized equipment required by the country's growing industrialization. The time span for which

¹⁵ Dr. Thorp finds that the earliest recorded depression in America came in New England in 1640. See his *Business Annals*, p. 112.

decisions and plans had to be formed was greatly lengthened. It was easier to make mistakes; and mistakes when made were more costly. A wave of mistakes might precipitate general deflation and depression.

Finance, too, was characterized by a very delicate constitution. Capital expansion and widespread speculation greatly increased the use of credit and extended monetary and banking facilities. Here again a cumulative process was always potentially at hand, and a slight disruptive force could set the whole organization toppling. Meantime, the internal organization of the country became more and more complex and greater interdependence resulted from the extension of market areas and increased specialization.

The Crisis of 1819 and the Period 1817-1832 ¹⁶

The crisis of 1819 may be traced to an interplay of monetary over-investment with the exogenous factor of a decline in the export demand for foodstuffs. Investment in Western land had been stimulated by high prices brought by agricultural staples during the War of 1812 and the sustained demand during the post-war period. Land values soared and the turnover was rapid. The transactions involved required large amounts of money and these were supplied by a rapidly expanding banking system. But the investment could not be supported indefinitely by the banking system, and a point was reached where a contraction in the monetary supply became necessary. This reduction was made in 1817 and 1818. Banknote circulation declined from about \$110,000,000 in 1816 to \$65,000,000 in 1819.¹⁷ In 1817 an attempt had been made to force resumption of specie payments on the note issues of the banks and this movement brought about some contraction in the amount of loanable funds. Then in 1818 difficulties besetting the Second United States Bank aggravated the general financial stringency. The inability of the banking system to sustain the prevailing rate of investment any longer prepared the way for the bursting of the speculative bubble.

A circumstance entirely unconnected with the economy helped to precipitate a crisis.¹⁸ The European demand for foodstuffs, which had been maintained at a high level during the reconstruction period following the Napoleonic Wars, fell off sharply in 1819. Prices fell correspondingly. Wheat, cotton, and corn led the way in 1819, and a gen-

¹⁶ See Thorp, *Business Annals*, pp. 118-121; and Smith and Cole, *Fluctuations in American Business, 1790-1860*, Sections I and II.

¹⁷ See Albert Bolles, *Financial History of the United States*, Vol. 2, p. 329. New York: D. Appleton-Century Company, 1891.

¹⁸ The interaction of the two sets of factors was graphically described by a Philadelphia publication in 1818: "A great crisis approaches—slow in its march, but deadly and relentless as the yellow fever which desolated your cities—and like it compounded of foreign contagion acting upon internal predisposition." (From Smith and Cole, *Fluctuations in American Business, 1790-1860*, p. 21.)

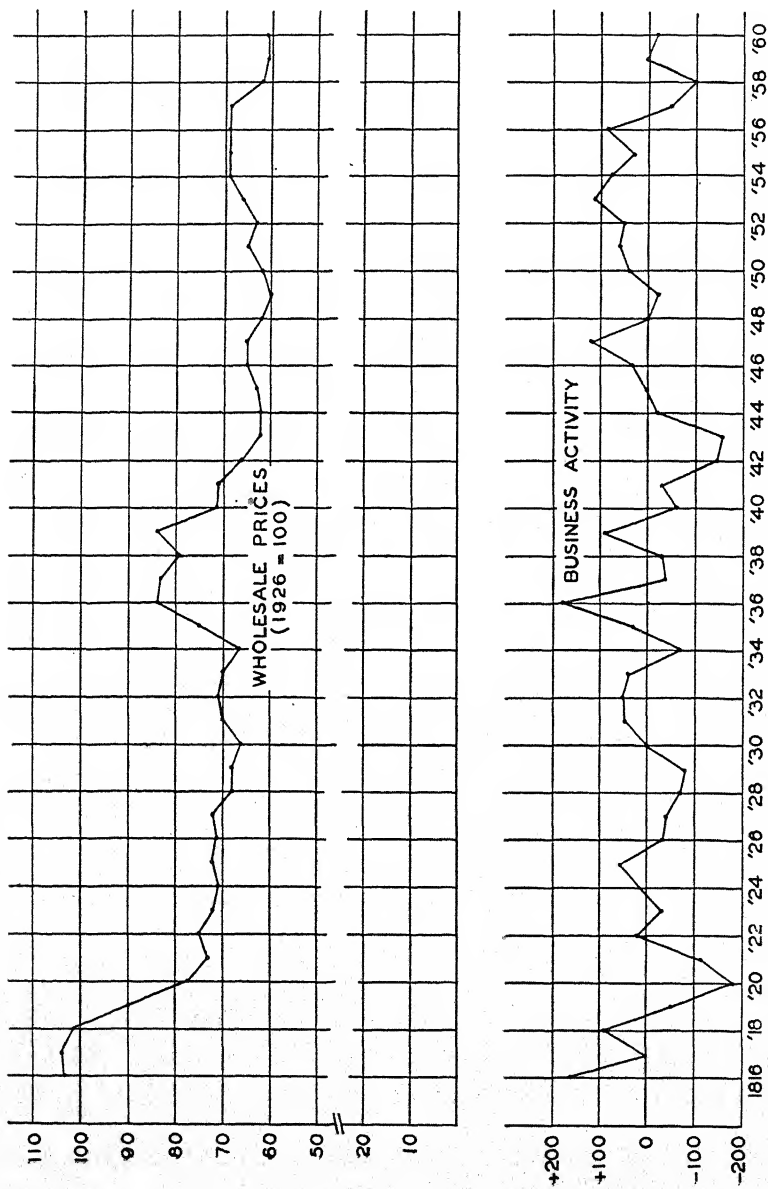


FIG. 2. Wholesale Prices and Business Activity: 1816-1860. Sources: "Wholesale Prices," United States Bureau of Labor Statistics (Jesse M. Cutts, "One Hundred and Thirty-Four Years of Wholesale Prices," *Monthly Labor Review*, July, 1935); "Business Activity" based on Cleveland Trust Company monthly index.

eral drop in prices followed in 1820. The index of wholesale prices (1926 base) fell from 102.2 in 1818 to 89.7 in 1819, 76.6 in 1820, and 73.2 in 1821.¹⁹ The result was a general depression affecting both industry and agriculture.

The depression was characterized by a rise in interest costs, a fall in property values, and a growth of bankruptcies and unemployment. The rise in interest costs grew out of the general scarcity of loanable funds that accompanied the contraction of note issue and the suspension of specie payments by the banks. The fall in property values took place in both urban and rural areas. With the general deflation of values and scarcity of funds, debts remained unpaid and bankruptcies resulted. Production and trade fell off and unemployment became widespread, requiring a great extension of poor relief.

The West suffered the most severe consequences of the depression and, as has been usual in this country's history, adopted the most radical measures for meeting the situation. Debt moratoria of various degrees were declared in several states. In some places laws were passed preventing foreclosure and seizure. Monetary measures were also adopted to increase the supply of loanable funds. In a number of states new banks were established to issue notes and make loans to debtors. But, as is typical in such cases, the increase in note issue was excessive. Loans were extended too freely, spending increased more rapidly than supply, and hence commodity prices rose. The scales now turned, and creditors were at a disadvantage. In the 10-year period from 1823 to 1833 conditions generally improved with only a few minor recessions. The country had suffered a sharp crisis and had come out of it with the aid of an expansionary monetary policy.

The Crisis of 1837 and the Period 1833-1848 ²⁰

The crisis of 1837 represents another instance of monetary overinvestment coupled with unfavorable exogenous developments. The main cause of the crisis was the speculation in land in the new Western territories that were opening up. Urban land values also rose, particularly in rapidly growing metropolitan communities like Chicago and New York.²¹ The upward movement was encouraged by internal improve-

¹⁹ Jesse M. Cutts, "One Hundred and Thirty-four Years of Wholesale Prices," *Monthly Labor Review*, July, 1935. The figures for this period are based on the work of Professor Alvin H. Hansen.

²⁰ See Thorp, *Business Annals*, pp. 121-124; and Smith and Cole, *Fluctuations in American Business, 1790-1860*, pp. 37-84.

²¹ "The craze was not confined solely to the West and the public-land sales. The rise in the value of real estate in New York was one form the speculative spirit assumed in the East. From \$250,000,000 in 1830, the valuation of real property in New York rose to \$403,000,000 in 1835, being an increase of 50 per cent in five years." (Reginald C. McGrane, *The Panic of 1837*, p. 45. Chicago: University of Chicago Press, 1924.)

ments, mainly canals and railroads. The new lands were thereby made more accessible and their actual and potential value increased. The high point in this development came in the year 1836, when the sale of land reached a peak.²²

Speculation was made possible and encouraged by the great increase in the supply of loanable funds of both domestic and foreign origin. The number of banking institutions increased after 1832 and the bank-note circulation consequently rose.²³ The availability of loanable funds, indispensable to Western territories for financing speculative activity and real investment, was enhanced by the transfer of the assets of the defunct United States Bank to Western banks. A large influx of foreign capital, to some extent in the form of a specie inflow,²⁴ increased the availability of loanable funds and tended to ease the terms of borrowing. It found its way directly into speculative and business activity and also absorbed state bonds issued to finance internal improvements.

The business boom that could trace its origin largely to monetary factors could likewise trace its end to monetary factors. The supply of loanable funds could not increase without limit; a stage of complete inelasticity of the monetary supply was reached and a severe contraction resulted. Both domestic and foreign factors contributed to this stoppage and reversal in the flow of loanable funds for speculative and business investment. A primary domestic factor was Jackson's Specie Circular of 1836, which required payment in specie for public lands purchased. This provision inevitably reduced speculative activity because the available supply of specie, even with the current inflow from abroad (which, as will be indicated below, also ceased), was inadequate to sustain operations at the previous level.²⁵ To make matters worse, there was the embarrassing Government surplus of 1836 that had arisen largely out of the sale of public lands and thus was repre-

²² "It was all-absorbing, that engrossing desire to catch the golden opportunity, whose swelling tide wafted to wealth. The physician, intent upon some proffered bargain, when asked by his anxious patient how his medicine was to be taken, answered abstractedly, 'one quarter down, balance three annual installments.'" (Guy H. Salisbury, *The Speculative Craze of '36*, p. 323. Publications of the Buffalo Historical Society, Vol. 4. Buffalo: The Peter Paul Book Company, 1896.)

²³ In the decade, 1829 to 1839, the number of banks increased from 329 to 840. Their capital grew from \$110,000,000 to \$327,000,000 and their loans rose from \$137,000,000 to \$492,000,000. See Davis R. Dewey, *Financial History of the United States*, p. 225. New York: Longmans, Green and Company, 1918.

²⁴ The reduction of the public debt to practically nothing in 1835 was an important factor in improving the country's credit standing and inducing an inflow of foreign capital. See W. G. Sumner, *History of American Currency*, pp. 128 ff. New York: Henry Holt and Company, 1874.

²⁵ The Treasury refused to redeposit with the banks the coin received in payment for land. "The treasury would insist upon receiving specie for itself, but how the banks were to get it was none of its concern." (Margaret G. Myers, *The New York Money Market*, Vol. I, p. 169. New York: Columbia University Press, 1931.)

sented by deposits in Western banks. In distributing this surplus to the states in quarterly installments in 1837, a transfer took place from Western banks to Eastern banks. Since Western banks had to contract their loans, the total money supply was restricted. At the same time, a financial stringency developed in England and resulted in the repatriation of capital that had been invested in the United States.

In addition to these monetary difficulties, agricultural conditions were affected directly by a drop in the price of cotton in the English market. And as if this were not enough, crop failures occurred here. These developments had repercussions in the banking centers where agricultural production was financed. The New York banks had to suspend specie payments and it was not long before most of the other banks in the country followed suit. Nor was this the end. In the early part of 1839 specie payments were resumed, but another reaction soon set in. In the latter part of 1839 the tottering United States Bank (chartered as a state bank by Pennsylvania) finally collapsed, the proximate cause being an unsuccessful attempt to keep up the price of cotton in order to protect the Bank's investment, thereby setting loose a string of specie suspensions in the Western and Southern parts of the country.

A general deflation followed these crises. The Cotton Belt suffered most severely, and perhaps even more in the second crisis than in the first. The disturbed condition of the banking system intensified a depressed situation that expressed itself in the low level of production, sales, employment, land values and rents, and prices of commodities. The index of wholesale prices (1926 base) fell only slightly in the crisis of 1837, the decline being from 83.5 in 1836 to 82.8 in 1837 and 79.4 in 1838, but after a recovery to 83.5 in 1839 it fell sharply to 71.1 in 1840 and reached a low point of 61.8 in 1843.²⁶

The recovery was effected by two radically different policies. In New York and in the New England states, Nature was allowed to run its course. Credit contracted severely, and improvement had to start from a low level of activity. In other parts of the country, relief measures were adopted and credit expansion was undertaken. Business activity reached its low point in 1842 and then started to improve, but not before steps had been taken to guard against a recurrence of the events of the past few years. Some state governments incorporated into their constitutions a prohibition against state borrowing for the purpose of financing either internal improvements or banks. Banking laws were also reformed to keep a stricter rein on the growth of banking institutions. To guard against the inflationary and deflationary effects of redistribution of Treasury funds held in private banks (and partly for other reasons), the independent Treasury system was established in

²⁶ Cutts, "One Hundred and Thirty-Four Years of Wholesale Prices." (Based on work of Hansen and Senate Committee on Finance, 1893.)

1840. This measure made economically innocuous its distribution of funds from one section of the country to another.²⁷

After 1845 a consistent recovery resulted from these measures and from an exogenous factor, an increase in exports of foodstuffs, induced by the Irish potato famine and the repeal of the English Corn Laws. A minor recession in 1847 and 1848, also caused by exogenous factors, namely, banking difficulties in England and depressed conditions on the Continent, had little retarding effect on the generally improved course of business.

The Crisis of 1857 and the Period 1849-1860 ²⁸

The crisis of 1857 again was dominated by monetary overinvestment, with both domestic and foreign exogenous factors operating. During the first part of this period, business activity took an upswing that has become known as the "Golden Age." This upswing was characterized by large investments promoted and accompanied by an expansion in the money supply, a rise in the price level, and a general improvement in business activity. The increase in investment took the form primarily of railroad construction that opened up new territories to commercial exploitation.

Increased demand led to an expansion of manufacturing, agriculture, and trade, accentuated by increased foreign purchases of foodstuffs arising from a crop failure in Europe in 1853 and the Crimean War. This increased demand brought about a rise in prices of commodities such as cotton, of slaves, and of land. Once more land speculation played a prominent part in the boom. This boom, in turn, was geared to an expansion in the supply of money and credit. The discovery of gold in California, the growth of banking, and the influx of capital from abroad (mainly into railroad companies²⁹) increased the supply of loanable funds and facilitated the investment and business activities of the country.

The supplies of capital turned out to be inadequate to maintain the investment projects undertaken. Most of the railroads were completed, but revenues lagged, since the development and exploitation of the territories served by the railroads was a slow process. Continued supplies of capital would have been required to maintain the railroads in this

²⁷ A serious disadvantage, however, was that the funds held by the Treasury became sterilized as long as they were so held. Thus, Treasury operations in acquiring and spending funds resulted in a net absorption or release of funds in the economy at times that were not guided by considerations of sound fiscal policy.

²⁸ See Thorp, *Business Annals*, pp. 124-127; and Smith and Cole, *Fluctuations in American Business, 1790-1860*, pp. 87-138.

²⁹ England alone had some \$400,000,000 invested. In the period 1848 to 1859, railway mileage increase from 5,996 to 28,789. See Ira Ryner, *On the Crises of 1837, 1847 and 1857 in England, France and the United States: An Analysis and Comparison* (Lincoln, Neb.: University of Nebraska Studies, Vol. 5, 1905, No. 2, p. 14).

early phase. But the expansion of the monetary supply was stopped and a restriction of capital precipitated by developments outside the immediate sphere of operations.

A panic on the New York Stock Exchange in 1854 restricted finance and caused many business failures, but a quick recovery took place and speculation continued to a high point in 1857. Then followed a sharp credit contraction traceable to several factors.³⁰ A capital outflow took place, partly as a result of a withdrawal of foreign funds to meet financial difficulties in Europe and partly to offset an unfavorable trade balance left by a failure of the Louisiana sugar crop and an increase in imports. Worst of all, the capital outflow took the form of a loss of specie, which immediately created difficulties for the banks. At the same time, railroads were forced into failure through an inability to obtain further credit accommodation to meet interest obligations. The banks, in turn, had heavy stakes in the railroads. The sudden collapse of the Ohio Life and Trust Company, considered a pillar of sound finance, gave the first alarm. Many banks failed and the suspension of specie payments spread widely.³¹

In the resulting period of depression railroad building ceased completely, and concomitantly employment and business activity in general fell. Commodity and land prices fell sharply and speculative activity ceased. The index of wholesale prices (1926 base) dropped from 68.5

³⁰ The acuteness of the financial situation is suggested by a Wall Street doggerel of 1857:

"Rushing around the corners,
Chasing every friend
Plunging into bank—
Nothing there to lend—
Piteously begging
Of every man you meet."

(Quoted by Samuel Reznick, "Depression and American Opinion, 1857-1859," *Journal of Economic History*, May, 1942, Vol. II, No. 1, p. 12.)

³¹ An apparently able contemporary writer places the major share of the blame for the financial crisis on the poor management of bank officers:

"It is a false notion, that panic comes from mysterious and unmanageable causes. So long as we give credence to this commercial fatalism, and accept it as an excuse for the incapacity of financial managers, we shall be liable to a recurrence of panic whenever an adverse wind sweeps the ocean.

"If there had only been an able man among bank officers, in whom the others had confidence, to take the lead, the panic might have been crushed in the bud."

"This was a common and freely-expressed opinion among all classes of merchants. It is a singular fact, that must occupy the foreground in any history of the suspension of 1857, whatever part different writers may assign to accessory causes. In the fright and confusion which succeeded the failure of the Ohio Life Insurance and Trust Company, our bank officers fell back, each to his separate place, to 'fortify' his institution, though at the expense of every private and common interest of the market. They did not recognize, in any one of their number, that superiority of intelligence and capacity in management, which in times of anarchy and doubt never fails to be felt—never fails (where it is known to exist) to be called on to lead. Never, in the whole course of our commercial history, did the public distress cry louder for the ability that can unite separate interests for a common purpose; and for the want of it, no common purpose was created. Everything went by chance, or by necessity." (J. S. Gibbons, *The Banks of New York and the Panic of 1857*, pp. 387-388. New York: D. Appleton-Century Company, 1858.)

in 1857 to 62.0 in 1858, 61.0 in 1859, and 60.9 in 1860.³² The depressed conditions provoked widespread and growing unrest among the working classes. Since the crisis of 1857 had originated to a large extent in financial overexpansion, the sharp credit contraction and financial reorganization seemed to remedy the situation and bring about recovery. At any rate, business improved and by the end of the period before the War Between the States reached a prosperous condition.

The vulnerability of the American business community to unbridled credit expansion and to external influences is amply demonstrated in the period to 1860. Given a readily expansible monetary supply and a growing economy, speculative activity became dominant and overinvestment took place. So weak was the foundation of the credit supply, however, that the slightest breath of ill wind could topple the whole superstructure. A withdrawal of foreign capital, a reduction of exports, or the failure of a large house could bring nationwide deflation and depression. The fault lay in the weak banking system and in the absence of basic regulatory measures controlling credit expansion. Unpredictable exogenous factors could not have wreaked such disaster if, even with a rapidly growing economy, the monetary situation had had some basic elements of stability.

In relieving the crises two opposing schools of thought prevailed. Expansionary monetary and fiscal remedies were adopted mainly in the Western and Southern parts of the country, while sharp credit contraction and deflation were allowed to take place in the "sound-money" Eastern states. If avoidance of subsequent crises be the criterion of success, neither policy has a record of which it can be very proud. Again, the basic instability of the monetary situation suggests the source of the difficulty. Whether the recovery is "healthy" or "unhealthy" makes little difference if it can soon turn into a speculative craze.

Economic Trends

The long period extending from the earliest Colonial days to the eve of the War Between the States saw the growth of the country from an undeveloped satellite of Europe to a mature nation that, like Europe, met serious internal difficulties of its own. The country was still heavily dependent on the rest of the world, but it had at least achieved some diversification of its output and had removed some of the earlier impediments to progress. The centralization of economic power in the Federal Government had developed to a considerable extent, but the banking situation was still little more than hopeless when it came to dealing with financial crises. The physical and economic growth of the

³² Cutts, "One Hundred and Thirty-four Years of Wholesale Prices." (Index for this period based on report of Senate Committee on Finance, 1893.)

country intensified the complexity of the problems attending progress free from excessive, albeit temporary, setbacks. In spite of setbacks, a review of the developments of the period as a whole indicates that favorable achievements were made. These gains may be measured by the national income and its composition, and by the length of the working day and the average length of life. Income reveals the quantity of commodities and services available for current consumption or future production, while length of the working day and of the average life span indicate the effort required to produce these goods and the length of time in which they might be enjoyed. Whether people were happier at the end of the period than at the beginning no one can say—no successful utilometer or index of the soul has yet been devised—but with respect to material matters there is a substantial record of favorable progress.

National Income and Its Composition

The record of national income goes back only to 1799 and is available only by decades for the period under review. In 1799 the real income per capita was in the neighborhood of \$211.³³ By the end of the period, in 1859, it had reached \$300. This rise indicates fairly well the growth in the economy's productivity per capita during the 60-year interval, as the two years were in roughly the same cycle phase, namely, that of "revival."³⁴ The figures for the intervening decades show very clearly the effects that wars and financial crises had on the country's growth. In 1809, a year of "depression," real income per capita was \$202 and in 1819, a year of "severe depression; financial panic," it was only \$168. Likewise in 1829, which saw first "depression" and then "revival," the real income per capita was at a low level, \$166. In 1839, which is characterized by "revival; panic; recession," the figure was just

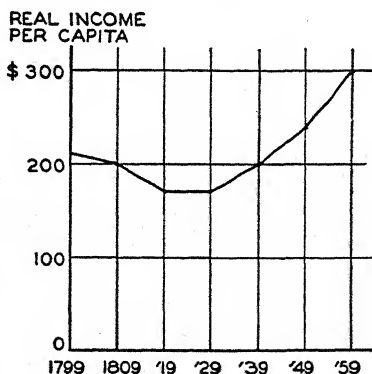


FIG. 3. Real Income Per Capita, 1799-1859 (Decade Figures). Source: Robert F. Martin, *National Income in the United States, 1799-1933*, p. 6. New York: National Industrial Conference Board, 1939.

³³ Owing to the paucity of primary statistical series in this early period the national income estimates must necessarily be to a considerable degree approximate. The estimates presented here are those of the National Industrial Conference Board. The "realized national income" is used to approximate national income. The monetary figures are deflated by an index of the general price level. The deflated figures are in terms of 1926 dollars. See Robert F. Martin, *National Income in the United States, 1799-1933*, pp. 6-7. New York: National Industrial Conference Board, 1939.

³⁴ See Thorp, *Business Annals*, pp. 114-127, for the cyclical phase of all the years discussed here.

under \$200. The year of "prosperity," 1849, saw a real income per capita of \$241. The growth of approximately 50 per cent from 1799 to 1859 suggests the rapidity with which expanding population and resources were brought into economic production.

The industrial composition of the national income demonstrates the tendency, however unspectacular, toward greater diversification in the country's production. From 1799 to 1859 the importance of agriculture in the national income fell from 39.5 per cent to 30.8 per cent while manufacturing rose from 4.8 per cent to 12.1 per cent.³⁵ Although the country was still far from self-sufficient it was gradually becoming more nearly capable of maintaining its living standards in case of a breakdown in its relations with other parts of the world.

Length of Working Day and Length of Life

In a country in which the main industry was agriculture, little could be done to reduce the length of the working day since "sunrise to sunset"

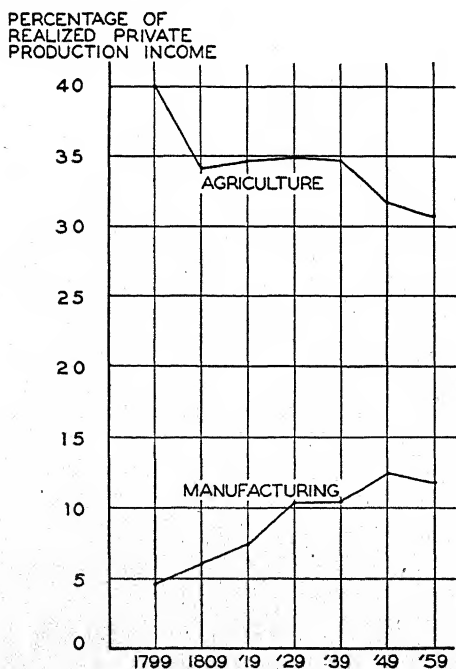


FIG. 4. Percentage Shares of Agriculture and Manufacturing in Realized Private Production Income: 1799-1859. Source: Robert F. Martin, *National Income in the United States, 1799-1938*, p. 60. New York: National Industrial Conference Board, 1939.

was, and is, the agricultural working day. In manufacturing, the deplorable conditions that prevailed in England set the standard for this country at first. The hours were the same as in agriculture. In summer this meant 14 to 16 hours a day, with two hours or less off for meals. In winter it meant 9 to 12 hours, with one hour or less off for meals. There were few holidays other than the Sabbath. Early efforts by workers' organizations to obtain a 10-hour day met strong opposition in a public opinion that seemed to accept sunrise to sunset as the standard of "industrious habits." Concerted action began in 1833, led by building tradesmen and followed by blacksmiths, mechanics, tailors, ship-workers, and others in skilled crafts. By the autumn of 1835, after

³⁵ Martin, *National Income in the United States, 1799-1938*, p. 60.

strikes in Boston, Philadelphia, and Baltimore (and several smaller towns) most city craftsmen had won the 10-hour day. The less highly skilled workers, especially in the cotton and woolen mills, worked longer hours. Worker agitation persisted, and in many states laws were passed setting a 10-hour legal day except where contracts specified otherwise. These laws, however, were largely ineffective in practice. In 1840 the President of the United States declared the 10-hour day for Federal employees.³⁶ Widespread and co-ordinated effort to reduce hours of work in this country dates back only to about 1850.³⁷ The achievements were clearly not very great in this period but in certain narrow fields considerable progress had been made.

Systematic records of current mortality in any large area of the United States were not compiled until the beginning of the present century, but there were a few early attempts to prepare life tables for the populations of American communities. It is necessary to piece the available fragments together in order to obtain some indication of the trend. Among the first of these was a life table based on the mortality for part of Philadelphia in the years 1782, 1788, 1789, and 1790.³⁸ According to these observations, the expectation of life at birth in Philadelphia seems to have been about 25 years. In 1789 a table gave an expectation of life for Massachusetts and New Hampshire of about 35 years. A table compiled in 1850 gave a life expectation of 38.3 years for males and 40.5 years for females. The estimate was 39.8 years for both sexes in a table for 1855 and became progressively higher with the publication of later tables. Allowing for incomplete statistics there would seem to have been an increase of 10 to 15 years in length of life from the end of the Colonial period to 1860.

The transition from Colonial to national status, the increased diversification of production, and the growth in power of the central Government showed their effects on the standard of living during the period ending in 1860. The increased real income per capita and the reduction in the length of the working day were tangible evidences of material progress; and the improved conditions of health that resulted in a longer life were indications of better living conditions. Nevertheless, the progress that took place was not by any means spectacular, in material terms at least. The reason for this must be found in the severe shocks to which the economy was subjected in war and peace. With every step forward it apparently had to take more than half a step backward.

³⁶ See *The Five-Day Week in Manufacturing Industries*, p. 9. New York: National Industrial Conference Board, 1929.

³⁷ L. T. Beman, *Five Day Week*, p. 43. New York: The H. W. Wilson Company, 1928.

³⁸ See Louis I. Dublin and Alfred J. Lotka, *Length of Life*, pp. 44, 54. New York: Ronald Press, 1936.

Conclusions

The history of American economic development to 1860 demonstrates the hazards of relying entirely on the "invisible hand" to maximize economic welfare. Repeated speculative booms and "busts" in peacetime and serious dislocations in wartime indicate that a visible hand must guide the invisible. Otherwise the general level of activity suffers and with it private enterprise and individual well-being.

The crises of 1819, 1837, and 1857 show that some regulatory measures would have promoted rather than hampered progress. Individual zeal led to overinvestment that ran far ahead of real values and outstripped the capabilities of the country's weak financial mechanism. To dampen such zeal a little by restricting speculative activity and credit expansion would have increased rather than diminished individual achievement and would have strengthened rather than weakened individual enterprise. The benefits of dynamic growth could have been gained at less cost. The real and permanent losses in the period of deflation and depression nearly equaled the apparent and transient gains of speculative inflation and artificial prosperity. The country's record of canal, railroad, and farm building in this period was based on individual and state enterprise but owes little to excessive and speculative inflation and deflation of security and land values.

The economic experience of the Revolutionary War and the War of 1812 shows that neither too much nor too little reliance should be placed on short-term estimates of individual or national well-being. The natural reluctance to pay increased taxes and the apparent advantage (if only of expediency) of other methods of war finance led to such severe inflation, depreciation, and finally deflation and depression that in the end the individual and the nation were worse off in both war production and post-war income than if a more realistic and farsighted fiscal policy had been pursued. At the same time, when a freely operating price mechanism was suddenly supplanted by price-fixing, there were serious effects on the production and flow of commodities and services because full recognition was not given to the requirements of the private sector of the economy. This process was demonstrated convincingly in the effects of the abortive price conventions and fixed-price requisitions of the Revolutionary War. Although the precise degree of control necessary to establish a sound economy can never be accurately determined, the dangers to be avoided seem to be indicated by the experience of this period.

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CHAPTER 17

Westward Expansion Since the Homestead Act

Westward Expansion and the Frontier

THE WESTWARD MARCH of American civilization since the War Between the States has provided one of the most dramatic chapters in our national history. Who from his school days has not heard and been thrilled by the tales of the covered wagon, the Plains Indian, the transcontinental railroad, the Texas Ranger, and the cowboy? And, in the latter years of machines and national planning, who has not been impressed by Coast-bound streamliners and stratoliners, the power combine, Boulder Dam, and the miracles of dry farming and reclamation? The winning of the West in reality and in legend is the proud and unique possession of every American.

The location, volume, and speed of our westward expansion since 1860 can be measured most simply by comparing the population density map for that year with that, for example, of 1890 (see pages 343-345). Except for a sizable projection into eastern Texas and a smaller extension into Kansas and Nebraska, the frontier line of 1860—beyond which the population was less than two persons to the square mile—followed the 95th meridian almost exactly from the Gulf of Mexico to central Minnesota. From there it ran slightly south of east to Lake Huron, leaving the northern parts of Minnesota, Wisconsin, and Michigan beyond the fringe of settlement; northern Maine and southern Florida were likewise beyond the two-per-square-mile line. Thus, except for the settlements on the Pacific Coast, the people of the United States in 1860 lived in a compact diamond-shaped mass with its sharpest points in Maine and Texas and its greatest density in its northeastern quarter.

Within the short span of one generation the frontier as a distinguishable unbroken line had disappeared, a fact cited by the director of the 1890 census and subsequently brought into prominence by F. J. Turner when, in 1893, he compellingly drew attention to the significance of the frontier in American history.¹ Since that time, unfortunately, the loose notion has often prevailed that because the traditional continuous line gave way about 1890 to a series of internal borders, the frontier itself had passed and the westward movement of which it was the accepted

¹ See Chapter 5, above.



FIG. 2. Distribution of the Population of the



United States in 1890. *Source:* Eleventh Census.

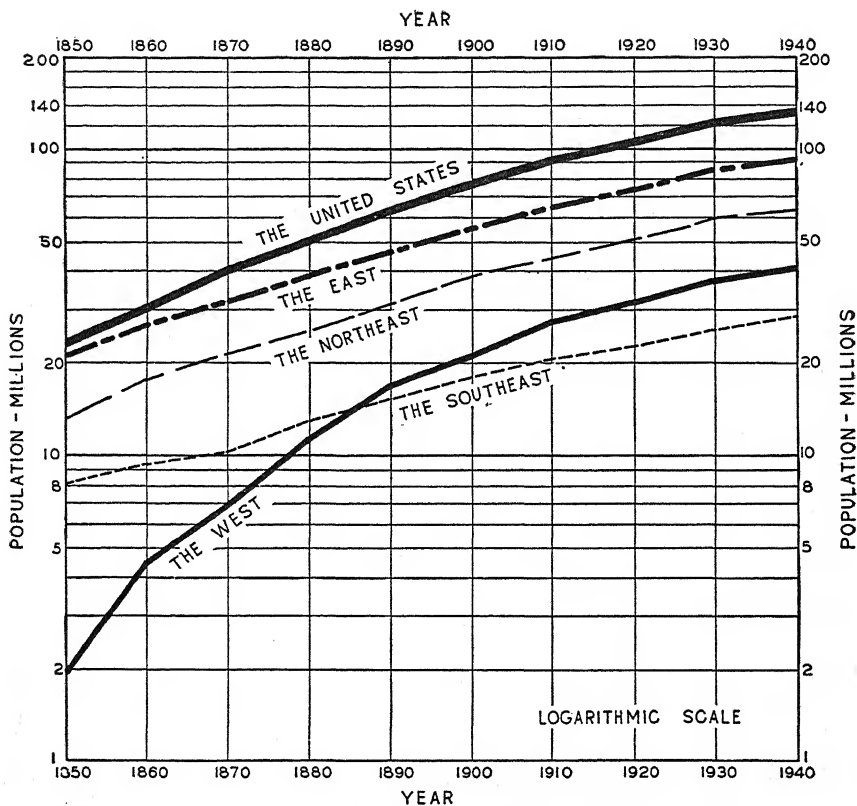


Fig. 3. Relative Population Increase of the Several Sections of the United States, 1850-1940. Source: Sixteenth Census, 1940. States included in sections shown on chart (dates after Western states indicate year of admission to the Union):

The West { Arizona (1912), Arkansas (1836), California (1850), Colorado (1876), Idaho (1890), Iowa (1846), Kansas (1861), Louisiana (1812), Minnesota (1858), Missouri (1821), Montana (1889), Nebraska (1867), Nevada (1864), New Mexico (1912), North Dakota (1889), Oklahoma (1907), Oregon (1859), South Dakota (1889), Texas (1845), Utah (1896), Washington (1889), Wyoming (1890).

The Southeast { Alabama, Delaware, District of Columbia, Florida, Georgia, Kentucky, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia.

The Northeast { Connecticut, Illinois, Indiana, Maine, Massachusetts, Michigan, New York, New Hampshire, New Jersey, Ohio, Pennsylvania, Rhode Island, Vermont, Wisconsin.

The East—The Southeast plus The Northeast.

The United States—The East plus The West.

badge had come to an end. Nothing could be further from the facts or, for that matter, from Turner's original interpretation.

Since 1890 expansion into the West has continued; the geographical center of population has steadily moved westward, although its rate of movement has indeed decreased since the turn of the century.² Furthermore, those states beyond the frontier line in 1860 added more people to their population in the 30-year period following 1890 than they did between 1860 and 1890. And from 1920 to 1940, despite the intensive industrialization in the East and Middle West, they added 24.1 per cent to their population in comparison with a national growth of 24.0 per cent. The relatively rapid growth of the West in contrast with other parts of the nation, particularly between 1850 and 1910, is revealed in the chart on page 346. It should be noted that even since 1910 western expansion has kept pace with national growth; or, to put it another way, more than four times as many acres have been patented under the Homestead Act since 1890 as between the passage of the law in 1862 and that date. Finally, the so-called birth-residence index of native white population reveals that since 1860 there has been a consistent and continuing net westward movement originating in the New England, Middle Atlantic, and East North Central states.³ Furthermore, since the War Between the States there have been two distinct forms of native white migration: one agricultural in nature, the other industrial. The former has been characterized by a steady westward flow of population from a reservoir that has itself gradually shifted west; it is probably true that this movement, representing the traditional advance of the general farmer, was largely complete by 1910 although the continuing expansion into the Pacific Coast states since then has been partly agricultural. The migration accompanying industrial expansion, on the other hand, has been toward manufacturing centers in the Great Lakes region and on the North Atlantic as well as on the Pacific coasts.

Throughout the period since 1860, foreign immigrants first from the northwestern and then from the southeastern part of Europe have swelled the stream of city-bound migrants far more often than they have joined the advance to the agricultural West. As W. J. Trimble noted a generation ago, it was an American population reinforced by immigrants from abroad that opened the mines, subdued the forests, threw out daring lines of railroads, and broke the prairies.⁴ Except for the Deep

² It has been estimated from preliminary 1940 census returns that the center of population has moved three miles eastward since 1930. If this be true, the westward trend has apparently been checked, at least temporarily.

³ This index is arrived at by comparing the number of persons born within a particular state but living outside it with the number of those born outside of the same state but living within it. Carter Goodrich, Bushrod W. Allin, C. Warren Thornthwaite and others, *Migration and Economic Opportunity*. Philadelphia: University of Pennsylvania Press, 1936.

⁴ W. J. Trimble, "The Influence of the Passing of the Public Lands," in *Atlantic Monthly*, Vol. cxiii (June, 1914), p. 775.

South, where racial considerations make comparisons inapplicable, the Western states—those beyond the frontier line of 1860—have consistently had not only the smallest percentage of foreign born population, but also the largest percentage of Americans born in other states.

It may therefore be said that since the passage of the Homestead Act of 1862 the westward movement has been continuous although in many respects the nature of the movement itself has changed. The sources of internal migration have shifted gradually westward from New England and the East Coast; over the same period the principal sources of foreign migration moved, within Europe, from the northwestern to the southeastern portion of the Continent. Advancing first as a solid wall of settlement, the frontier in this country broke up about 1890 into many isolated frontier regions each with its own characteristics and problems; since 1910 migration has resulted primarily from a desire to join in industrial rather than agricultural expansion. The westward movement probably still continues, though in decreasing tempo. Despite a sturdy and colorful contingent of foreigners, the westward march has been a movement principally of native Americans.

The Elements of Westward Expansion

It is axiomatic that three primary elements affect a decision to move: (a) a practical means of transportation, (b) reasons for leaving an old home, and (c) reasons for going to a new home. The first factor is indispensable, for obviously without a feasible carrier for man and his goods no amount of push or pull can cause movement. But if transportation is available, either extreme dissatisfaction with one's existing location or an equally extreme desire to reach some new spot is enough to cause migration. Actually, of course, elements of both push and pull are generally present.

In considering any migration these factors must be kept firmly in mind, yet the very fact that they affect in such varying degrees any individual decision to move makes their separate analysis of questionable value in an historical discussion. A more logical approach to a movement such as that into the American West is to describe first the area of immigration with its resources and opportunities, and to consider next the regions of emigration together with the people and conditions prevailing there. A second step is to examine the role of transportation; and the final procedure to analyze the combined agencies of push, pull, and transport inducing movement, the obstacles limiting their operation, and the interaction of such forces to produce a net shift of population. That procedure will be followed in this analysis.

The West and Its Possibilities

The development not only of mining, lumbering, cattle raising, and agriculture but also of trade, industry, transport, and professional services has been determined in the West by the possibilities and limitations of the land. Thus the key to westward expansion lies in the physiographic character of the region beyond the Mississippi (see map, pages 350 and 351).

If an intending migrant, poised on the threshold of the Great West in 1862, could have been omniscient, he would doubtless have been overawed by the vastness and variety of the land and the opportunities laid out before him.⁵ In that year, the frontier line north of Arkansas lay near the western boundary of the broad Interior Lowlands, a level, humid area extending from the Appalachians roughly to the 20-inch rainfall line that bisects the Dakotas, Nebraska, and Kansas in a north-and-south direction. The western portion of this province, then still to be settled, embraced some of the nation's best land for corn and wheat raising; Wisconsin offered an ideal situation first for lumbermen, then for dairy farmers. Some coal existed in Iowa, and more in Missouri, Kansas, and Oklahoma; oil lay beneath the surface of the two last-named states.

The Ozark Plateau and Ouachita Mountains, in southern Missouri and northern Arkansas between the Interior Lowlands and Coastal Plains, presented a rugged and relatively uninviting prospect to the farmer, although hogs, cattle, sheep, and corn could be raised, if only for local use. Timber and the lead deposits of southern Missouri were more stable assets.

The western reaches of the Coastal Plain embracing Louisiana and eastern Texas lay near the edge of settlement in 1862 and furnished an area of expansion for the cotton culture of the South. Rice and sugar cane could be grown in Louisiana, while the southern portion of Texas was well-fitted for cattle raising, truck gardening, and growing of citrus fruits. Oil, so vitally important to our present-day economy, underlay large sections of northeastern Texas.

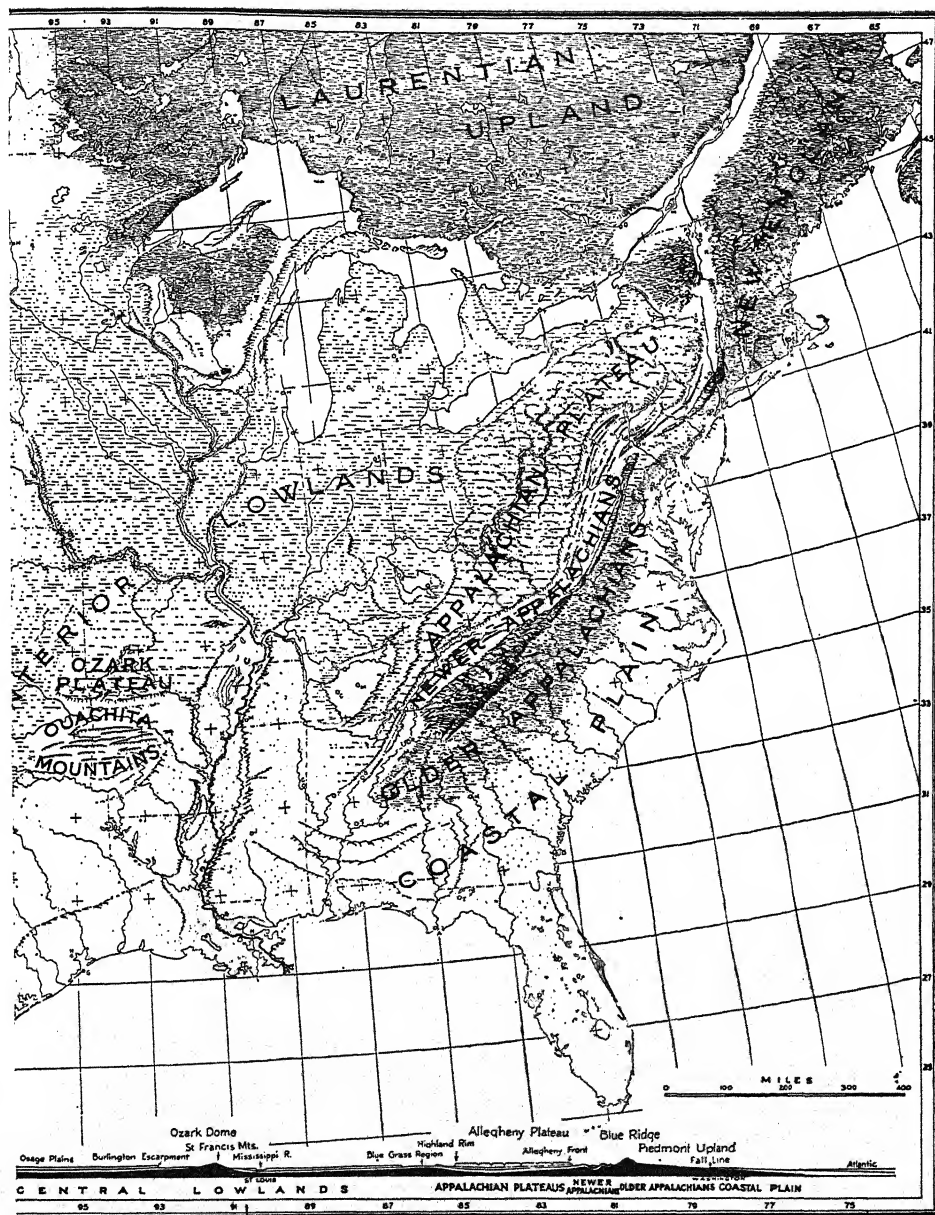
Like a great swath cut across the West from Canada to Mexico, the treeless Great Plains extended westward from the 20-inch rainfall line to the Rockies. Although the terrain was generally level, rainfall was both scanty and irregular, so that the province offered more inducements to the cattleman than to the farmer. In the northern portion where evaporation was less rapid, however, agriculture, especially when aided by irrigation, was possible. Like a huge isolated citadel in this province

⁵ The physiographic provinces described in the following pages are those set up by A. K. Lobeck in the text accompanying his physiographic map published by The Geographical Press, Columbia University (New York, 1932).



Map Geographical Press, Columbia University, New York

FIG. 4



Copyright, 1932, by A. K. Lobeck. Published by The Geographical Press, Columbia University, New York.
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rose the Black Hills of South Dakota, with their abundant timber and varied mineral resources.

As Lobeck described it, the high, rugged area west of the Great Plains as far as the Pacific could be considered as three belts running from north to south. The easternmost included the Rocky Mountain chain, attractive to the immigrant primarily for its minerals and timber. West of the mountains lay the Interior Plateau country, subdivided into three easily distinguished sectors. On the north was the Columbia Plateau of eastern Washington and Oregon and southern Idaho. In central Washington the rich soil formed by decayed basalt, the moist winters and springs, and the dry hot summers offered a rare combination to the wheat farmer and fruit grower. Eastern Oregon and the Snake River region, on the other hand, with far less moisture, were primarily suitable for ranching. Directly south of the Columbia Plateau lay the Basin and Range Province, its northern half roughly coterminous with the state of Nevada, its southern half extending like the tip of a horn along the southern portions of Arizona, New Mexico, and into the extreme western Panhandle of Texas. The unifying features of this Province were its dryness and its succession of isolated ranges and basins. To the pioneer farmer it held out few charms and was a desert to be avoided or a difficult obstacle to cross. For the miner, however, the region was little short of a paradise with its wealth of gold, silver, copper, lead, and zinc. It was for the twentieth-century farmer to find that irrigation would permit agriculture to thrive in such areas of rich soil as exist in western Nevada. The Colorado Plateau Province was the southernmost portion of the Interior Plateau, bounded on the north by Wyoming, on the east by the Rockies, and on the south and west by the Basin and Range Province. Threaded by great canyons it was and still is a barrier to land transportation. Although timber was plentiful on the higher tablelands, its inaccessibility put it beyond the reach of the lumberman; elsewhere the dry climate and sandy soil held few attractions.

The Pacific Ranges marked the westernmost physiographic belt in the United States. This region, long and narrow, was bounded by two parallel rows of mountains: the Cascades and Sierra Nevadas on the east, the Coast Range along the shore. Where California and Oregon met, the two mountain rows were connected by the Klamath Mountains; elsewhere they were separated by the Puget Sound Lowland and Willamette Valley on the north and by the Great Valley of California on the south. The gold of the Sierras was, of course, known to everyone who started west after the middle of the nineteenth century; later the value of other minerals and of the giant redwoods came to be appreciated. To the north the Cascades and to the west the Coast Range likewise abounded in timber; all three ranges possessed untold stores of water

power. It was the valleys, however, that offered the greatest variety of opportunities. The well-watered Willamette Valley that resembled northern Illinois or Kentucky would support wheat, potatoes, grasses, fruit, berries, and livestock; the dense forests of the Puget Sound Lowland, though attractive to the lumberman, made clearing and hence agriculture less simple. The Great Valley of California, however, would grow almost any type of vegetable or fruit, wheat, barley, rice, and alfalfa; it was likewise suitable for cattle raising and possessed vast stores of oil beneath its surface. The southern California coast, in addition to its horticultural possibilities, offered a climate and landscape that, after 1890, were to prove a veritable magnet for retired farmers, businessmen, health-seekers, and, eventually, the movie-makers.

In the early sixties the possibilities of this prodigious area west of the line of continuous settlement were not, of course, fully or by any means accurately known but—and this was important—they were suspected. Ever since the mid-forties the Oregon Trail had witnessed a steadily growing stream of farmer-pioneers filing into the fertile Willamette Valley. Late in that decade Kearney's march to southern California and the world-famous gold rush to the Sacramento region had highlighted at least some of the assets of that fabulous state. Meanwhile the Mormons, astride the Overland Trail, were beginning to demonstrate what could be done with irrigation on the desert. In 1853 Jefferson Davis, then Secretary of War, initiated the survey of five transcontinental rail routes, and when the War Department, in 1855, published its findings in no less than 13 thick volumes describing parallel bands of territory running east and west from the Canadian border to Mexico, a new storehouse of information was available for the asking. In the late fifties a second gold rush brought bands of wealth-seekers to Colorado, and from these came enticing tales of the Rocky Mountain area. Nearer the East the steady advance of the trapper and lumberman in Wisconsin and Minnesota, of the dirt farmer in Iowa and Kansas, and of the cotton grower and rancher in Texas served as a more substantial if less romantic indication of westward expansion.

The opportunities of the West, both actual and potential, were legion. Naturally, the appeal was primarily to trappers, miners, lumbermen, cattlemen, and farmers. But the activities of these men created the need for the teamster, the ubiquitous general storekeeper, the carpenter, the miller, the tanner, the packer, the printer, and the preacher. And, as settlement progressed, the banker, the lawyer, and the schoolteacher were soon regarded as necessities. To the railroad builder the West presented a superb promise as well as a mighty challenge. Save for such rivers as the Missouri, Arkansas, Sacramento, and lower Columbia, navigable streams were few and the opportunities for the provider of land transportation, if properly chosen, were boundless.

This was the country the migrant of 1862 faced; the golden opportunity of developing its primary mining, lumbering, and agricultural resources was the basic cause of our westward expansion. Without these advantages railroads would never have been built across its wide acres, the Indian would have remained undisturbed, and certainly the industrial development of the nation would never have reached its present proportions. The opportunity existed; westward expansion was inevitable.

The Occupation of the West: A Summary

By 1862 the trapper had marked out his trails and the mining advance had already penetrated into California, Colorado, Nevada, Arizona, Idaho, and Montana.⁶ Soon after the War Between the States, mines were opened in Wyoming as well. Operations were first carried out on public land where an extra-legal code of procedure was enforced in the absence of effective public law. Aside from producing gold and silver to fill the nation's expanding commercial needs, this mining advance stimulated the agricultural settlement of the Rocky Mountain and California areas; the cattle-raising industry in particular got its start as a by-product of these mining rushes. Furthermore, transportation facilities, especially in Colorado, were built in response to mining needs. Thus, this one phase of expansion had a cumulative effect on the movement as a whole. One counteracting result was the provocation of Indian wars, which served, temporarily at least, to retard settlement. Eventually the mining industry, following the pattern of big business elsewhere, became largely a corporate rather than an individual undertaking and its effect on expansion became more difficult to trace.

The lumber industry that blossomed in the West at the close of the War Between the States turned first to the extensive white pine stands in upper Michigan, Wisconsin, and Minnesota. Transportation by way of the Mississippi or the Great Lakes was readily at hand, and by 1870 the established mills of Maine and Pennsylvania began to feel the pinch of falling prices brought about by competition from the West. Meanwhile, lumbering began on the West Coast. Until well after the turn of the century, however, the center of the industry was in the northern portions of the old Northwest Territory. Thereafter the operations of the Far Northwest began to assume major proportions. As the lumber trade flourished it attracted to it a steady stream of newcomers. Like the mining advance it often blazed the trail for the agriculturist and contributed positively to westward expansion.

Texas, even before the War Between the States, was a breeding ground for cattle. After the conflict ended and as the Indian settlements were

⁶ See Chapter 5, above.

concentrated in the late sixties, the practice of driving cattle northward for grazing and eventual shipment East came into vogue. Such towns as Abilene, Fort Dodge, Ogallala, and Glendive sprang up as receiving centers for stock driven north. By the mid-eighties, breeding on the northern ranges and the advance of settlement in the Central Plains ended the colorful long drive. Cattlemen began instead to fence in large areas of public domain for their herds, though not without encountering the strenuous opposition of farmers and, eventually, of the Government. Closed-range ranching, with stock grazing on leased land, has characterized the industry since the turn of the century. Throughout its development the prospects offered by cattle raising have proved a potent factor in westward expansion.

The lure of the West, however, has always operated most strongly on the farmer. By 1870 the northern portions of Michigan and Iowa, the eastern part of Kansas and Nebraska, and many regions in Colorado—all largely vacant in 1860—had felt the plow. A decade later most of Nebraska, northern Wisconsin, and the Red River Valley of the North had been occupied; Oklahoma was virtually surrounded by farmers. By 1890, as the director of the census duly noted, the frontier line had disappeared before this agricultural advance.

This expansion was based on grain production. The Winter Wheat Belt eventually spread from southwestern Illinois and southern Iowa across Missouri and Kansas into southern Nebraska and central Oklahoma. To the north, principally in the Red River Valley, spring wheat was the principal crop. Between these areas, in Indiana, Illinois, Iowa, and eastern Nebraska, lay the Corn Belt. The possibilities of these crops were doubtless more responsible than any other one factor for expansion westward; emigration from the older farming areas of northern Illinois and Wisconsin forced those regions to turn to dairying, a readjustment that contributed, in part, to the discontent culminating in the Granger Movement. In the eighties, wool raising was attracting men to Montana, Wyoming, Texas, and the Far West. By the turn of the century, the opportunities for fruit growing in the coastal states were being steadily developed.

Inevitably, this mighty advance led to the rise of milling, meat packing, and other processing industries in such centers as Chicago, St. Louis, the Twin Cities, Omaha, and Kansas City. Steel mills were built at Pueblo and on the Pacific Coast. And, along with these activities grew the businesses of supply, construction, banking, transport, and professional service. Meanwhile, the advance of pure and applied science made more easily available the economic resources of the West. Such inventions as the chilled plow, barbed wire, the combine, the double-rotary saw, the windmill, the hard-surfaced road, and the tractor—to mention only a few—have lightened man's labor. Improved processes

such as high-speed milling and gradual reduction of wheat, mechanical loading of ore boats, the refrigerator car, dry farming, and high-pressure pipelines have given man greater returns for his labor. Construction of huge dams and extension of irrigation have opened new areas for development. The basis for these developments and their substantial contribution to the westward movement lay, however, in the original possibilities of the land.

Such, in briefest terms, was the nature of America's western expansion. But whence did the people come who answered the call of the West? How did they get there? What were the obstacles that qualified the attraction of the region and what attempts were made to overcome them? How, in short, was westward expansion possible?

The Reservoirs of Emigration

In view of the basic fact that American economic life of the late nineteenth and early twentieth centuries was characterized by the concurrent rise of the city and development of the agricultural West, internal migration on a large scale was inevitable. One important and obvious distinction, however, must be made at the outset. The attractive forces of the West, when they operated successfully, resulted exclusively in expansion to the West whereas the dislocating forces in the areas of emigration did not necessarily, or even usually, do so. Consequently, in describing and analyzing the centers of emigration, it is necessary to take into account the fact that as some emigrants left a given region for the West, others were leaving, in varying numbers, to grasp the countless industrial and commercial opportunities of the city.

The most striking fact that emerges from statistics of migration is that much of the westward expansion of Americans, particularly into the great central agricultural area, was accomplished by a long succession of very short moves. Of 2,115 persons who purchased land in a given area of southeastern Nebraska in 1873, for example, no less than 944 came from Nebraska itself or from the neighboring states of Iowa, Missouri, and Kansas, in that order. The old Northwest Territory states (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin) sent 621; the Middle Atlantic states (New York, Pennsylvania, New Jersey, and Maryland) sent 137; Kentucky, West Virginia, and Tennessee accounted for 29, and all of New England for only 24 persons. These proportions roughly repeated themselves in the years 1874-1876, inclusive.⁷

The more general figures from the census confirm these trends, and

⁷ R. C. Overton, *Burlington West: A Colonization History of the Burlington Railroad* (Cambridge, Harvard University Press, 1941), pp. 421-423. Compare: Fred A. Shannon, "The Homestead Act and the Labor Surplus" in *American Historical Review*, Vol. XLI, No. 4 (July, 1936), pp. 637-651. See esp. p. 645.

indicate their growing intensity as the decades passed. In 1870, Illinois, whose surplus of native-born Americans from other states over locally born emigrants was the highest in the Union, counted 1,461,522 newcomers born in neighboring states of the East North Central district of which it was a part; the next largest contingents came, in order, from the Middle Atlantic, East South Central, and New England regions.⁸ In 1880 and 1890, Kansas showed the nation's highest surplus in the same respect; in both decades, its newcomers had been born principally in neighboring states; the next ranking contributory districts were the East North Central and Middle Atlantic states. When, in 1900, Texas showed the greatest surplus, the largest number of immigrants had been born in Arkansas and Louisiana; the next largest in the East South Central states, and the next in the South Atlantic states.

Even the states on the periphery of the westward movement, though not at first adhering to the general trend of short moves, eventually fell in line. For example, most of the people in Montana in 1870 who had been born outside of that state came from the East North Central region, followed closely in order by natives of the Middle Atlantic states. By 1880, however, and again in 1890, migrants to Montana from other states in the Mountain region led settlers from beyond local limits; the East North Central region was in second place and the West North Central in third. Since 1900 the order has become and remained: Mountain—West North Central—East North Central. Even California, nationally known as the mecca of health-seekers, and New Mexico have, ever since 1870, drawn the greater part of their American immigrants from other states in the Pacific and Mountain areas, respectively.

Why did farmers, small tradespeople, and the like wish to move from the fertile, level plains of Illinois and Iowa, and from the still-growing Midwestern centers of trade still further west? Why, in the 1890's and 1900's did they wander into the sandhills of western Nebraska, the flats of Oklahoma, and the dreary plains of the Dakotas? Why, in other words, did the reservoir of emigration move toward an area that in preceding decades had been the prime object of westward expansion, particularly when pushing factors in the East and Europe were as strong as or stronger than before?

The movement took place, primarily, because of the pull of a new country, the vision of ever better opportunities, and the chance to begin life anew in denser forests, richer mines, wider fields, and busier towns. Yet there were elements of push in these Midwestern areas that became operative soon after the first settler arrived. Good lands near adequate

⁸ The geographic regions cited in this and following paragraphs are those conventionally used by the Census.

transportation were often entirely taken up by the first breathless influx; physiographic, marketing, and social conditions frequently turned out to be far less agreeable than the visionary migrant expected; the prospect of tenancy, when it appeared, was a possible deterrent; and the competition of forests, mines, and farms farther west many times presented almost immediate problems. Furthermore, such periods of acute agricultural distress as occurred in the Midwest during the seventies and nineties as a result of overexpansion, drought, land monopoly, and other causes not only made the prospective migrant hesitant, but bred discouragement leading to a countermigration back East or to a movement even farther west. Finally, it must not be forgotten that Midwesterners were themselves the children of people who had once moved; the tradition of moving westward was strong among them. They were also the first to receive reports of new regions and new resources, and being less firmly established than people in the East or in Europe had fewer connections to sever. And, of course, they were geographically nearer to the areas to which they wished to move; consequently, the labor and expense of migration was proportionately less. Whatever the reasons—and they are as yet by no means fully explained—the westward expansion in America has consistently drawn its greatest numbers from the nearest sources. The exceptions to this general rule, however, are important. This same westward expansion has throughout its history been strongly reinforced and leavened by contingents from areas in the East and from Europe.

Prior to the War Between the States the small farms and pastures of New England, upstate New York, southern New Jersey, western Pennsylvania, and Ohio produced grain, sheep, and cattle as well as dairy products and vegetables. Small mills and shops, foundries, distilleries, tanneries, and the like nestled by countless waterfalls and produced a wide variety though small quantity of manufactured articles. Each township center boasted, on a miniature scale, a well-rounded commercial and professional existence. Yet could such an economy withstand the post-war developments? Could the Vermont farmer, hoeing by hand the corn on his tipped, rock-studded fields, compete with his Illinois or Iowa counterpart whose teams could pull labor-saving cultivators across broad level acres? Could the tiny specialty mills and foundries of Maine, western Connecticut, northern New York, or central Pennsylvania compete with even the forerunners of mass production in the large urban centers? Could the banker, the lawyer, the doctor, the maker of furniture and of carriages, even the preacher find as promising an outlet for his talents or as pressing a need for his services at home as in the lustily growing counties of the West? The answer, particularly plain to the young farm hand, mill apprentice, or law clerk, was "no";

in increasing numbers he yielded to the pull of the city or to the lure of the West. In a sense he was impelled—pushed—into moving.⁹

For certain classes the economic outlook in the Old South was even less promising than in the Northeast, Middle Atlantic, or East North Central states. The collapse of the plantation system based on slave labor removed the traditional stabilizing element of Southern economic life. Capital was scarce and the small-scale white farmer was ill equipped by training and too few in numbers to create and maintain an independent agricultural society. Too often the alternative was to become a tenant farmer or to move, either to such near-by industrial centers as Birmingham or Atlanta, or farther west.

By and large, then, the choice offered the Eastern farmer or small townsman was to move to the city or to go west. Often he chose the latter course. In fact, though he made many stops on the way—sometimes for years or for a generation—it was he who formed the backbone of the Eastern contingent in the West. Within this movement from the East, from the close of the War Between the States onward, the Northerner was in the great majority even though his lot to begin with was probably better than was the Southerner's. The reason probably lay in higher per capita savings enabling the Northerner to move and start anew, his experience as farmer, "mechanic," or small businessman that was readily adaptable to conditions in the West, his innate energy and restlessness and, particularly before 1885, his far superior means of transportation. Nevertheless, after that date, movement from the Old South to the Southwest was of considerable proportions.

The basic urban and industrial development of the East that partly induced so many of the stresses in other regions and occupations itself generated, from its own excesses, a centrifugal force. This force, however, was not directional; it did not necessarily propel the persons on whom it operated into the West or any other particular region or occupation. It was merely an explosive agency tending to blast people loose from where they were.

Obviously, the chief cause of movement from industrial centers was economic depression, yet there are almost no data to indicate that the unemployment that was a logical prelude to emigration was discoverably

⁹ Although most Easterners went west as individuals or as small groups, some traveled in colonies possessing the common interest of place of origin, race, religion, or the like. The recorded occupational abilities of such groups casts an interesting light on the type of person for whom the colonizers of the agricultural West, at least, held out the best chances of success. One such colony, for example, in process of organization in Deckertown, N. J., in 1872, with Nebraska as its destination, advertised for 80 farmers, 5 carpenters, 5 masons, 2 merchants of general merchandise, 2 blacksmiths, and 1 each of: doctor and drug store proprietor, hardware merchant, harness maker, lawyer, miller, minister, printer, schoolteacher, undertaker and furniture dealer, and watchmaker.

mitigated by movement to the so-called free lands of the West. Despite the urgings of Horace Greeley and in the face of the plausible if unsupported "Safety-Valve Doctrine,"¹⁰ contemporary evidence from the West, fragmentary though it is, casts heavy doubt on the theory that the common laborer or skilled worker solved his difficulties by moving westward, unless he settled in other industrial centers. The principal reason for this immobility of the laboring population—and it applied with equal force to the factory émigrés from abroad—was that subduing the forests, breaking the prairie, and herding cattle were not occupations easily learned. Nor could such activities be undertaken with any assurance of success without enough financial backlog to provide food and other necessities until the first returns came in. Finally, it cost money to move west and, in most cases, to acquire land or a base of operations.

As one colonizing railroad in Nebraska warned the public during the seventies:

Before coming to purchase lands, see to it that you have the necessary means, and make careful consideration as to their expenditure. None should come without proper forethought and needful capital; but with these the way is open and prospects bright.

It is difficult to make progress anywhere without capital, and nowhere is the need of money more keenly felt than in a new settlement.

You will require money for the expenses of transportation for yourself and family, and such household goods and stock as you may determine to bring; for the first small payment of interest on the land purchased; for buildings and other improvements; for farming tools and provisions until you can make and sell a crop.

... Business openings of all kinds are frequent, and labor and clerical assistance are required to a limited extent; but those coming without means and dependent entirely upon employment must take their chances. . . .¹¹

On other occasions, the same company suggested that every newcomer should have "a few hundred dollars to start with." Such warnings could have applied with equal pertinence to the mining areas of Colorado and California, to the ranges of Texas, and to the forests of Minnesota.

Lacking both experience and ready cash it is not astonishing that the factory worker, despite his hardships, stayed with his trade however much he shifted his scene of operations. Of course, the growing industrial importance of the Pacific Coast after 1910 offered a fresh start to the discontented Eastern or foreign laborer who could move. To the extent that he availed himself of this opportunity he fed the stream of westward expansion.

¹⁰ For a discussion of this doctrine, see Carter Goodrich and Sol Davidson, "The Wage Earner in the Westward Movement" in *Political Science Quarterly*, Vol. L, No. 2 (June, 1935), p. 161; and Vol. LI, No. 1 (March, 1936), p. 61; also Shannon, "The Homestead Act and the Labor Surplus."

¹¹ Burlington and Missouri River Railroad, News Sheet, March, 1873. (Quoted in Overton, *Burlington West*, p. 349. Reprinted by permission of the President and Fellows of Harvard College.)

In contrast with America, there were, even after 1860, stronger elements of push on the European than on the native of the Eastern United States. To the New World's pulling demand for cheap labor, the promise of free lands, and the increasing availability of low-cost ocean transportation was added the inability of many of the migrants to find employment at home in agriculture or industry that would enable them to live properly. This situation in Europe was, in the latter part of the nineteenth century, due to many causes; among the more potent were technological changes, the existence of large estates and the tenancy system, and the reduction of the death rate. Such elements of push were offset to some extent by sentimental ties to the old home and by legislative restrictions or social hostility against emigration. As letters from America reached relatives abroad, however, the break became easier and, notably in the case of Germany under Bismarck, governmental obstacles to migration were, for the time being, at least, removed. Thus the elements of push figured prominently in the causes of the enormous migration from Europe following the mid-sixties.

As in the case of native Americans, the West laid claim principally to farmers, although immigrants from Europe rarely moved to the outer frontier. As emigrant guides and some of the more conscientious colonizing companies stressed, pioneering was a highly specialized occupation and one that was manned principally by Americans seasoned by years or even generations of frontier experience. The Scandinavian, Swiss, or Russo-German Mennonite, for example, turned his attention toward a more intensive secondary frontier. Occasionally, a factory worker from Leeds or Rochdale would test his fortune in the West, but as one land-grant railroad sadly observed from experience, "The carpet makers of old England do not make the best of prairie plowers." With this very much in mind, the chief English agent of this same road informed his district assistants in 1872 that the class most desired was farmers. "There is," he wrote in reference to Nebraska, "room for agricultural laborers, a few Mechanics, and a few Shopkeepers, but at the same time I must urge you not, in my name, to promise employment to anyone as, in a comparatively new country, the facilities to persons dependent upon their labor are not so good as in older States. To Farmers, we offer great things: good climate, excellent soil, and Land for next to nothing."¹²

Except for farmers, and a scattering of tradesmen, craftsmen, and professional persons, the vast majority of foreign immigrants after the War Between the States, particularly of Irish, Italian, or southeastern European origin, remained in urban centers, principally in the East.

¹² Henry Wilson, Agent General of B. & M. R. R. R. in England to district agents, January 1, 1872. (Quoted in Overton, *Burlington West*, p. 365. Reprinted by permission of the President and Fellows of Harvard College.)

Transportation and Its Relation to the Westward Movement

Transportation affected westward expansion in two principal ways: it afforded a means of reaching the West in the first place, fulfilling an indispensable function in the process of migration, and it provided a channel of trade and communication for those already in the West, adding another element of pull toward that region. Since these two advantages were arrived at simultaneously, their achievement may be traced together.

Domestic transportation

In 1860 the railway network of the United States reached into virtually every county where population had attained a minimum density of 18 to the square mile (see page 522). A decade later the railroads north of the 37th parallel (which divides Kansas and Oklahoma) had caught up with the frontier line of two persons per square mile; the first transcontinental had struck boldly across sparsely settled plains and mountains to reach San Francisco while a second independent line was approaching Denver. In the South, because of the war, progress had been less rapid; Texas was still isolated from the national network. During the seventies the railways actually outstripped the solid farming frontier and carried even the trapper, miner, and lumberman far along their paths. During the following decade, the South, and Texas in particular, joined the North in the nation's greatest era of rail construction. A vast steel gridiron with lines approximately 14 miles apart was laid down in the area extending westward roughly to the 20-inch rainfall line at about the 100th meridian. Meanwhile, a less extensive but adequate system was built in Colorado, in the Pacific Northwest, and along the coast; by 1911 no less than seven transcontinental routes, each with numerous feeders, connected the Midwest with the Far West.

The census reveals beyond any doubt that the participants in the traditional westward expansion of the farming frontier were principally natives of the New England, Middle Atlantic, and East North Central states, or foreigners who entered through northeastern ports. Did these people, after 1865, dominate western expansion because railroads made the West particularly accessible to them, or were the railroads built, among other reasons, to carry a stream of migration already in existence? Both alternatives were partly true. A comparison of the railway network and population density over a period of years suggests that until about 1865 the rails generally followed population. Thereafter, however, particularly in the case of the Western land-grant roads, they preceded the area of continuous settlement and actively participated in expansion and colonization. Thus, quite aside from the many economic, social,

political, and religious factors pushing and pulling Americans and foreigners alike to the West, it is reasonable to assume that the existence and development of an East-West railway net that was predominantly in the North played a substantial part after 1865 in determining the origin of settlers of the American West (see Figure 3, page 346). Until 1916 the railway network continued to grow, reaching a total of 254,037 road miles. By 1941 it had shrunk to 233,670 miles, although in 1942 it was carrying more freight and passengers than ever before.¹³

The rise of the American railroads after 1865 brought about a sharp decline in river and canal traffic. After the War Between the States passengers turned almost in a body to the rails. Although the shift in freight traffic was slightly less abrupt, it was eventually as definite and, from a revenue basis, more decisive. There was, however, one important exception to this shift away from inland water carriers. Beginning in the 1880's the Great Lakes began to witness the growth of their technically superb fleet; although the effect on westward-bound passenger travel was temporary, a new outlet to the East was provided for the ore and, to a lesser extent, for the grain and lumber of the Northwest. At the same time, the West was provided with a cheap method of obtaining Eastern fuel. All these improvements in transportation inevitably made the West more attractive.

From the close of the War Between the States until about 1910, the supremacy of the railroads as overland carriers of both goods and passengers was virtually unchallenged. The direction and intensity of westward expansion were, until that time, both guided and limited by the presence or absence of the railway. As the second decade of the twentieth century began, however, the internal combustion engine and the hard-surfaced road combined to create a new and promising means of land transportation. In 1919 nearly 3,300,000 motor vehicles were registered in the 23 states west of the Mississippi alone. Most of these were passenger cars; such trucks and buses as there were operated locally rather than in inter-city trade. A decade later, however, registrations had increased to over 10,500,000, of which more than a tenth were trucks, many of them capable of long runs. By 1939 in these same states there had been a further rise of 9½ per cent in passenger cars, and 10½ per cent in all vehicles registered. Meanwhile, from 1917 to 1937, the na-

¹³ Supplementing railway development during the first 15 years of the twentieth century was the sudden rise and fall of the electric interurban railway. For the most part, however, this system was confined to the East and Midwest so that its effect on the westward movement was negligible. A more important supplement of the railways were the pipe lines that were gradually developed from the time of the War Between the States to carry petroleum all the way from the mid-continent fields to the Eastern Seaboard. Such carriers obviously could take no part in passenger transportation, yet their competition affected those that could, and their commercial service, as in the case of other cargo carriers, operated as an element of pull on the potential migrant.

tion's mileage of hard-surfaced roads quadrupled. Supplementing them thousands of miles of roads dating from the horse-and-buggy days and passable at least in dry seasons gave passage to Model-T Fords and every variety of "jalopy" and jitney chugging into out-of-the-way corners of the West with settlers and supplies, and offering a contact with previously inaccessible markets. From the standpoint of transportation, there were, after 1925, virtually no limits to the geographical expansion of the westward movement. Because of its small carrying capacity, the airplane has probably contributed less in transporting permanent migrants west than in offering an additional means of service and enterprise, thus making settlement in the West more attractive than before. It is worthy of note that the number of cities west of the Mississippi served by commercial air lines rose from 70 in 1929 to 116 in 1934. Although service has increased and improved, the number of points served has tended to stabilize around 115.

It may therefore be said that the traditional westward agricultural expansion, which preserved its identity as a cohesive, unified movement until about 1910, was accomplished almost solely by the railroads. Partly because of the location of these roads, migration was principally from Northern states. The frontier, in the sense of a single transitional border region, was punctured and then virtually obliterated by the iron horse; in its place were left countless patches of land, either wholly unsettled or sparsely populated, that had been by-passed by the rails. These areas were reached by the automobile and truck as they shouldered the task of the intensive settlement of the West.

The means of transportation: foreign and ocean

Except for Scandinavians and to a lesser extent Germans, who often chose farming rather than industry, a vast majority of the immigrants reaching our shores following the close of the War Between the States flocked to the cities. Among the many reasons for this urban preference were the possibility of more immediate cash return and the opportunity to work and live with fellow immigrants from the same country. Nevertheless, a substantial foreign-born contingent has always contributed both to the older advance of the farming frontier and to the subsequent intensive infiltration into the West. To the extent that this has been true, the American westward movement has really begun in Europe and, especially on the Continent, its direction and intensity have been facilitated or limited by the existence or lack of adequate transportation.

By 1860 the people of both Great Britain and Germany, who then accounted for most of our European immigration, were able to reach their own Atlantic ports with comparative ease. Distances were short, and the United Kingdom had already completed the greater part of its railway network. Germany, in addition to nearly 7,000 miles of rail-

roads, enjoyed a well-integrated passenger-carrying river and canal system. Although for other reasons France did not supply any appreciable number of immigrants to America, she possessed similar advantages of transportation, as did Italy; Norway and Sweden, far behind in rail development, counted most of their potential emigrants already in or near their seaports. Natives of these nations, when they wished to do so, could and did move easily to points of embarkation. From there, after 1860, the mass carriage afforded by the recently developed iron steamship solved the problem of how to reach the New World.

As the nineteenth century waned, the center of European railway construction moved steadily eastward. More railways, 8,525 miles, were built in the United Kingdom between 1851 and 1870, inclusive, than in any other 20-year period. Germany and Austria-Hungary, on the other hand, reached their peaks in 1871-1890, with totals of 14,164 and 10,714 miles, respectively. In the two succeeding decades, 1891-1910, Austria-Hungary almost duplicated its earlier construction with 10,684 miles; Italy added a third again to her system, while European Russia built a record 17,826 miles. In the light of these developments it is, perhaps, significant that by 1890 the peak of immigration from Great Britain, Scandinavia, and Germany had passed, whereas the crest of the influx from Austria-Hungary, Russia, and Italy was reached in the decade 1901-1910.

It would be unwise to read too much into these figures. Yet, when all allowances have been made, the expansion of the southeastern European railway net into the interior of nations whose masses previously had not had easy access to seaports undoubtedly was a factor determining the race and nationality of those Europeans who came to our shores and of the relatively small percentage who eventually took part in our own westward expansion. On the other hand, it must be remembered that occupation was probably a more decisive factor than nationality in the movement of immigrants to the West. To judge the relative importance of these elements is impossible; to recognize their existence is essential.

The Limitations on Westward Expansion and the Agencies for Overcoming Them

So far attention has been directed to the broad questions of why westward expansion took place and who, in general terms, participated in that movement. The elementary answers to these questions lay in the attraction of land and its possibilities, economic difficulties in the reservoirs of emigration, and a feasible means of mass travel by land and by sea. These basic elements moved into the American West a vast army composed principally of Americans dependent upon the primary possibilities of the land. Consideration must now be given first to some

of the limitations that have restricted and qualified this expansion, and second to the means by which man has endeavored to offset these limiting factors.

The limit of inaccessibility and Governmental aid to transportation

To the intending migrant of 1862, who still had before him a wondrous choice of places to go, the most immediate drawback was probably the lack of transportation. Technically, even at that date, there was no reason why railroads—the obvious solution to the problem—could not be built. The War Department's survey of 1855 indicated at least five mechanically feasible transcontinental routes. Yet what railroad builder who had traditionally laid his rails to tap existing sources of traffic could be expected to throw his lines into country with less than two persons to the square mile? And even assuming he would enjoy steady patronage from the outset of operations, how could he expect to meet current expenses, let alone recovering his original investment, until the farming and trading communities along his line became settled and productive? The answer was that he could not unless he were helped.

As it happened, a means and precedent for the necessary aid was at hand in the Federal land grants to railways. The first grant had been made in 1850 to the Illinois Central. Guided by this example, Congress during the fifties continued its policy, with the result that capital was attracted to the beneficiary roads. The most important grants so far as westward expansion was concerned were that of 1852 for a line across northern Missouri, and one of 1856 offering lands to four East-West roads across Iowa. By 1862 the Missouri line had been finished, and the four northern roads were on their way across the state. Consequently, in that year Congress took the logical and vitally significant step of offering a princely domain for the construction between Omaha and San Francisco of the first transcontinental railroad. Two years later this grant and the loan that had accompanied it were increased; at the same time lands—but not financial aid—were extended to feeders in Iowa, Kansas, and Nebraska. By 1871, when the practice was discontinued, Congress had granted a total of about 158,000,000 acres to aid railroads in every state west of the Mississippi River except Texas, where the United States owned no lands, and except in Oklahoma and South Dakota, then wholly or largely occupied by Indian reservations. East of the Mississippi, grants had been made to speed development of the then unsettled portions of Illinois, Michigan, and Wisconsin in the North, and of Florida, Alabama, and Mississippi in the South. All these lines had to agree to carry mail, troops, and all Government property at rates fixed by Congress, usually at a level of from 20 to 50 per cent below prevailing commercial railroad rates. Furthermore, unaided

competing lines in the same territory had to offer these lower land-grant rates if they wished to participate in moving traffic subject to such rates. Thus the land grants have proved to be a shrewd bargain for the Government.¹⁴ Eventually, a sixth of the total granted acreage was returned to the United States because certain railroads failed to build their lines according to the terms of the grants. Approximately 130,000,000 acres, however, were patented by the railroads and aided in the construction of some 21,500 miles of line in the new South and West. Roads built with the help of grants from Texas swelled this total. Since the land-grant states now contain 133,243 miles of road, it is obvious that most of the mileage was eventually built principally by private capital. Nevertheless, in the sixties and seventies when most of the Federally-aided lines were completed, they represented the more important part of the western mileage then existing, and provided a skeleton network reaching into much of the region that lay beyond the frontier line of 1862.

The mere completion of these roads would have given a lively stimulus to westward expansion. As it was, the highly organized and far-reaching colonization activities undertaken by many of the railway land departments speeded the entire process. To such companies, whose lines pushed into virtually unoccupied territory, the most important objective was the permanent development of the region as a source of traffic; a second logical objective was the sale of their granted lands. Thus, during the half century following 1854, such roads as the Illinois Central, Burlington, Union Pacific, Rock Island, Northern Pacific, Santa Fe, and Southern Pacific—to mention only the more active—launched extensive advertising campaigns in both this country and Europe in an effort to attract permanent settlers. These colonization activities reached their peak in the seventies and eighties. Lands varied in price depending on topography, water supply, timber, and accessibility; average prices were about \$4 or \$5 an acre. Almost all the large companies offered long credit, and some added such special inducements as reduced rates for immigrants and their goods, discounts from long-term prices as the reward for improvements, and the like.

Because granting of public lands to the railroads withdrew millions of acres from private entry, because it favored corporate interests allegedly at the expense of the community at large, because fraud and mis-

¹⁴ Land-grant rates on Government property over lines subject to land-grant deductions are 50 per cent of the commercial rail rates; mail rates are 80 per cent of regular commercial rail rates. Under the Transportation Act of 1940, application of land-grant rates was slightly restricted, although the total volume of traffic moving under such rates has enormously increased, thus further benefiting the Government. Through Equalization Agreements induced by competition, the Government has traditionally obtained the benefits of these reductions also from non-land-grant roads serving land-grant territory.

management characterized the disposal of certain individual grants, and because the most publicized references to land grants in general have been made by critics of big business, the entire policy has often been the object of sweeping condemnation. Yet the only full-length studies so far made of individual grants reveal that indiscriminate condemnation of the policy is not warranted;¹⁵ final judgment must be reserved until further studies are made. In any event, whatever the defects of the land-grant policy, it did result in the construction of lines essential at the time to westward expansion and national unity, and it prompted organized colonization that, when conscientiously carried out, immeasurably speeded western settlement. Whether, in some cases, it led to what twentieth-century hindsight regards as overdevelopment of marginal areas is a moot point; so far research has not revealed any particular correlation between areas of rail colonization and of economic distress. When the grants were settled, no development seemed too rapid or too intense for the buoyant Westerner. Probably at least a million persons bought land from railroads; if half of them were heads of average families, some three million migrants must have been directly affected by the policy.

In addition to lands received from the United States, railways in Western and Southern states received considerable land, as well as varying financial support usually in the form of security subscriptions, from town, county, or state sources. Competition to obtain railways was strong between communities whose access to market was essential, and these aids, usually exchanged for a definite promise to build on a specified route, were in effect bids for adequate transportation. In so far as these aids encouraged construction, they likewise speeded western expansion.

Railroads were by no means the only carriers to receive Government aid in the West. Highways and waterways had been assisted almost from the beginning of the Republic, and after 1862 such assistance continued and grew. Until about 1910, however, only the railroads could conveniently carry people in large numbers and goods in bulk; by that time the expansion of the agricultural West was nearly complete. Since 1910 Federal and state aid to highways in the states west of the Mississippi has continued. And, particularly since 1926, the United States had spent many millions to aid airway development in the same area. These newer forms of transportation, both by carrying people west and offering them service when there, have undoubtedly contributed to the westward movement; Federal subsidy has helped them perform this function. Yet Governmental aid to highways, waterways, and air lines

¹⁵ Paul W. Gates, *The Illinois Central Railroad and Its Colonization Work*, Cambridge, Harvard University Press, 1934; James B. Hedges, *Building the Canadian West: the Land and Colonization Work of the Canadian Pacific Railway*, New York: The Macmillan Company, 1939; Overton, *Burlington West*.

has been nationwide and has not generally involved public lands. Thus, although it has facilitated the intensive development of the West, it has done so incidentally. In contrast, the railway land-grant policy was formulated for the specific purpose of settling the West and the New South. That is why it is of prime importance in any consideration of westward expansion.

The Indians and Government policy

Until 1860, American Indians were constantly pushed westward on the easy assumption that there would always be enough room for them in the vast open spaces beyond the Mississippi. During the early years of the sixties it was apparent that this assumption was no longer valid. The wave of western expansion encouraged by more liberal land laws and the growing rail network was already reaching and in some cases overwhelming the red man. The mining rushes, for example, frightened away the Indian's game; railroad surveys and the opening of new army roads cut through some of his best hunting grounds. In 1862 the Sioux, and later the Arapahoes and Cheyennes, took the warpath to protect themselves against further encroachment.

Such outbreaks as these confirmed the Westerner's feeling against the Indians as both a physical menace and an economic obstacle, for in addition to their occasional—and often comprehensible—resort to war, they laid claim to some of the most desirable land in the West. Partly to solve these problems and partly to protect the Indians, Congress in 1867 adopted the reservation system and proceeded to concentrate the Indians principally in Oklahoma and the Dakotas. This task, accomplished none too gently, was supposed to be jointly handled by the departments of Interior and War, the latter taking control of "warlike tribes." Actually the conflicts over jurisdiction between the two departments aggravated the entire situation until in 1879 Congress gave the Department of the Interior full authority.

The reservation system, combined with the extinction of the buffalo, ended the military phase of Indian history. It did not, however, solve the land problem to the Westerner's satisfaction nor did it offer either social or economic stability to the Indian. In 1870 all but the Panhandle of Oklahoma, all of the western part of South Dakota, nearly a fifth each of Montana and Colorado, one-eighth of Arizona, and extensive areas in Minnesota, Wyoming, Idaho, Washington, Oregon, and New Mexico were barred to the white man except for restricted transit and trading privileges. Apart from the sizable reduction of Indian reservations in Colorado and Montana, the situation was virtually the same in 1880.

The Dawes Act, approved in 1887, opened a new chapter in Indian policy. The President of the United States was given authority to

subdivide tribal reservations among individual Indians; each head of a family was to receive 160 acres, and other members a smaller proportion; surplus land was to be purchased by the Government, the proceeds to form a trust fund for the tribes; no Indian could alienate or mortgage his land for 25 years, but upon receiving title, he became a citizen. The Five Civilized Tribes, originally exempted from the act, elected to follow its provisions in 1906.

This act paved the way for the occupation by Westerners of hundreds of thousands of acres hitherto unavailable. The most spectacular advance was into Oklahoma, which had long been the objective of neighboring whites. When, at noon on April 22, 1889, a cannon signaled the opening of part of Indian Territory to settlement, some 20,000 persons rushed across the border. By night the town of Guthrie was founded; by 1890, the Territory had 107,000 white inhabitants. The occupation of other former Indian lands was not so precipitate; but as the policies of the Dawes Act were carried out, reservations shrank rapidly until they ceased to offer a major obstacle to the white man.

The problem of land ownership and public policy

As 1862 opened, almost all the land except Indian territory beyond the frontier line was available for settlement; on the other hand, virtually none of it could be obtained free by the intending settler; he, like anyone else, was obliged to pay varying prices according to the particular law applicable to each tract. Land, the common treasure of the nation, was not yet the free heritage of the landless. Although its acquisition had become progressively easier in certain respects, public land remained what it had been since the nation was founded: an asset that was generally sold, and never given away except in exchange for some special service, past or prospective.

Western land could be acquired by purchase in a variety of ways: for cash from the United States; from states that had received land for internal improvement, swamp reclamation, education, or other purposes; from holders of scrip and military warrants; from railways; and, of course, from individuals. The homestead principle of free land in exchange for permanent settlement, however, was not strange to America; it had existed in the colonial policies of France and Spain and in the English headright system. Agitation for its revival had occurred time and again in the early days of the Republic, and the principle emerged as a major political and social issue in the mid-forties. Indeed, between 1842 and 1854 the United States offered from 160 to 640 acres free to settlers who would occupy, improve, and, if need be, defend remote portions of Florida, Oregon, Washington, and New Mexico. Yet during the fifties, as sectional lines hardened, it became apparent that the South, fearing a virtual Northern occupation of the West, would

defeat, either in Congress or through the Presidency, a general homestead measure. Thus, it was not until May 20, 1862, that Lincoln signed the Homestead Act, passed by a Congress unencumbered by Southern opposition.¹⁶

By its provisions, this act offered to any citizen or intending citizen who, among other things, was head of a family and over 21 years of age, 160 acres of surveyed public domain after 5 years of continuous residence and payment of a registration fee varying from \$26 to \$34. The law applied to all lands subject to purchase at \$1.25 under the Preemption Act, and to 80-acre lots within the lateral limits of railway grants. As an alternative, the homesteader could buy the land he had entered after 6 months' residence, at the regular price.¹⁷

Once the homestead principle was adopted, Congress logically, though sometimes with questionable wisdom, sought to apply it to special situations. In 1866, for example, mineral lands were thrown open freely for occupation, although within a decade many of these tracts were classified and restricted to cash disposal at prices varying from \$1.25 to \$20 an acre. In 1873 the Timber Culture Act promised 160 acres to anyone eligible for a homestead who for 10 years would keep trees growing not more than 12 feet apart on 40 acres. Five years later the minimum tree-growing area was reduced to 10 acres. In 1909, taking into account the arid nature of the land involved, Congress increased the maximum permissible homestead entries to 320 acres in portions of Colorado, Montana, Nevada, Oregon, Utah, Washington, Wyoming, and Arizona. A quarter of the area was to be cultivated and no commutation for cash was allowed. In 1916 a further enlargement to 640 acres was permitted for farmers who wished to raise stock.

Meanwhile, Congress continued to dispose of public domain that could be acquired by the individual, if at all, only by purchase. Two years after the approval of the Homestead law, Lincoln signed the Morrill Act, which granted to each loyal state for endowment of at least one agricultural college 30,000 acres of land for each senator and representative then in Congress. These lands were to be sold by the beneficiary states. Railway grants were continued until 1871, the largest being that of nearly 39,000,000 acres to the Northern Pacific. Three other measures, designed to accelerate disposal of nonagricultural land,

¹⁶ In 1860 a bill containing most of the features of a free homestead act was passed by both branches of Congress only to be vetoed by Buchanan.

¹⁷ During the next decade various amendments were added to hasten disposal. In 1864, for example, soldiers with 2 years' service were permitted to take title after 1 year's occupancy; in 1870 soldiers with 90 days' service could "enter" 160 acres within railway grants; 2 years later soldiers were allowed 6 months after "entry" before beginning residence, and their term of service in the Army, up to 4 years, was deducted from their residence requirements. Thus the Homestead Act was employed as a substitute for a perilous universal land bounty and at the same time soldiers were encouraged to move westward.

should be noted. One, the Desert Land Act of 1877, permitted purchase at \$1.25 an acre of 640 acres of arid land provided the buyer irrigated and cultivated at least one-eighth of the area; the maximum amount that could be bought was halved in 1890. The other two measures, both passed on June 3, 1878, were the Timber Cutting Act and the Timber and Stone Act, which together allowed for the first time the legal cutting and purchase of timber from the public domain. The West vigorously supported these laws. Under the first, bona fide settlers and mining interests were permitted to cut timber free for their legitimate use. Under the second, surveyed lands in California, Oregon, Nevada, and Washington, chiefly valuable for timber and stone but presumably unfit for cultivation, could be purchased in 160-acre lots at \$2.50 an acre.

Unquestionably the guiding principle of national land policy, at least until the last decade of the nineteenth century, was to promote the settlement of the nation by the disposal of the public lands to those private individuals or corporations who could and would use them. From the first years of the Republic, another principle, at times dormant and often reversed, had influenced land legislation. This was conservation of the nation's assets on, under, and above the public lands. The rush for lands between 1850 and 1890, however, made it physically impossible if not politically inexpedient for the Government to classify its vast holdings or to enforce what restrictions there were, such as those against removing timber and minerals. Even the West, which eventually stood to lose by the indiscriminate disposal of land, was lukewarm if not coldly opposed to measures that would conserve resources and favor the small settler at the expense of speedy occupation. Inevitably, then, a law such as the Homestead Act, which had originally been designed to aid the actual settler, was abused by agents of large holders or companies serving as dummy entrymen until title could be secured, while the acts that might have led to some conservation were openly flaunted. Titles under the Swamp, Timber Culture, and Desert Land acts all too often passed, frequently through speculators or hired agents, to wealthy individuals or companies whose prime interest was the exploitation rather than conservation of resources. The resulting concentration of ownership tended to make land purchase in the West more difficult for the small, independent buyer.

The general result was to speed land disposal not wisely but too well; by the time Cleveland came to the Presidency this fact, highlighted by the rapid disappearance of the best farming and timber lands, the rise of tenancy, and the emergence of land monopolies, began to be realized. Eventually, on March 3, 1891, an act was approved repealing the Pre-emption and Timber Culture acts, reducing the maximum entries under the Desert Land Act, extending from 6 to 14 months the period that

must elapse before homesteads could be commuted, and authorizing the President to set aside timber areas as national parks. Three years later the Carey Act authorized granting about a million acres to certain states provided they undertook settlement and irrigation, and in 1902, under the Reclamation Act, the Federal Government itself began to subsidize irrigation projects on public domain. Beginning spectacularly under Theodore Roosevelt, steady progress has been made during the twentieth century toward reclamation, conservation, and scientific use of land. At present no less than 176,000,000 acres are reserved in national forests; mineral, water power, and oil reserves (mostly in the form of subsoil rights) affect another 47,948,454 acres; and about 20,000,000 acres are under irrigation. Particularly since 1931 close attention has been paid to the wisest use of land. Recently the National Resources Planning Board has been correlating the classification of all land in terms of inherent characteristics, present use, use capabilities, recommended use, and program effectuation. National land policy now emphasizes planned development rather than indiscriminate disposal and settlement. This emphasis has been strikingly illustrated in the legislative and executive acts of the past few years. In 1934 passage of the Taylor Grazing Act permitted the Secretary of the Interior to withdraw from private entry some 80,000,000 acres not suited for farming, in order to turn these lands into grazing districts. In the following year all the remaining unreserved public domain of any value was withdrawn from private entry; being unsuited for ordinary farming, it will probably never be released for that purpose. In 1936, the Soil Conservation and Domestic Allotment Act supplemented earlier work of the Department of the Interior by offering subsidies as encouragement to farmers to preserve and maintain soil fertility. Finally, the activities of the Federal Government in resettling submarginal agriculturists must be considered a part of the program of conservation and land classification.

In most general terms, then, during the period from 1862 to 1891, rapid disposal was the prime object of Federal land legislation. Thereafter increasing attention was paid to adapting the laws to special physiographic conditions, to discouraging land monopoly, to conserving our natural resources, and, finally, to promoting intelligent land classification and use.

There is, of course, no doubt whatever that the land itself was the greatest single pulling factor in our westward expansion. In 1862 over a billion acres remained unreserved and unappropriated out of the original 1,441,436,160 acres in the 29 public land states. By 1904 a mere 473,836,402 acres remained unclaimed; today there is none. But which policies, which particular laws encouraged and made practicable the occupation of the Great West?

Traditionally, the Homestead Act has been eulogized as the concen-

trated wisdom of legislation for the settlement of the public lands and as the greatest democratic measure of all history.¹⁸ Certainly it did climax the long struggle for free lands, and undoubtedly the promise it offered provided a psychological stimulus to the prospective migrant. Its effect on the urban worker, however, was negligible; the mere fact that Congress provided no means for the laborer to reach the free lands would probably have been fatal apart from the occupational difficulties already noted. But what effect did the law have on those who turned West?

In 1904-1905 a special commission reported to Theodore Roosevelt on the disposal of the public domain of the territorial United States up to June 30, 1904.¹⁹ Their findings, segregated as to acquisition and availability to individuals (including companies), are shown in Table 1. Of the 610-odd million acres that had been or could be purchased in 1904, approximately 350,000,000, probably more, had been made available after June, 1862, to compete with approximately 150,000,000 acres taken up under the Homestead, Timber Culture, and other acts permitting free acquisition (see Table 2). Thus, over twice as many lands were acquired or available by purchase as were obtained free. Furthermore, many of the purchasable lands were held permanently by companies or individual large holders so that they were never offered to the small buyer. The willing buyer was generally able to crowd out the seeker of free lands, since no specific acreage in the West was reserved for the homesteader. What free lands there were near towns or railroads were generally snapped up in the first rush; in fact, they were claimed the moment a town site or railway route was staked out, often by squatters and land agents. Consequently, as Gates has pointed out,²⁰ the settler who followed the initial influx was usually faced with the choice of buying from a speculator, a railroad, or a state on the one hand, or of going further afield where opportunities for social and economic intercourse were limited. However anxious these selling agencies may have been (and many were not) to attract actual settlers to the land by advertising, easy credit schemes, and aid to the settlers, and however justified their acquisition of the public domain had been in the first place, the fact remains that, at least between 1862 and 1904 when the traditional frontier line was disappearing, they barred most of the land, especially the best portions of it, from free settlement under

¹⁸ For summaries of eulogistic references to the Homestead Act see Roy M. Robbins, *Our Landed Heritage* (Princeton: Princeton University Press, 1942), p. 209, and P. W. Gates, "The Homestead Law in an Incongruous Land System" in *American Historical Review*, Vol. XLI, No. 4 (July, 1936), pp. 652-681. See esp. pp. 652-654.

¹⁹ United States, 58th Congress, 3rd Session, Senate Document No. 189, *Report of the Public Lands Commission* (Washington, 1905).

²⁰ Gates, "The Homestead Act in an Incongruous Land System" in *American Historical Review*, Vol. XLI, No. 4 (July, 1936), p. 652.

TABLE 1

DISPOSITION OF THE PUBLIC DOMAIN, 1789-1904

A. Acquired by or available to individuals by purchase only:

	<i>Acres</i>	
1. Cash sales:		
Before June 30, 1880	196,755,216	
Since June 30, 1880	79,803,004	
Former Indian lands	1,116,038	277,674,258
2. State grants:		
School lands	69,058,443	
Swamp lands	65,739,266	
Internal improvements	20,587,863	155,385,572
3. Railroad, state, and corporation grants patented, certified, or withdrawn	117,550,292	
4. Private claims	33,440,482	
5. Private wagon roads, canals, river improvements..	9,712,425	
6. Agricultural colleges (Morrill Act)	7,672,800	
7. Timber and Stone Act	7,596,078	
8. Mineral lands	1,731,276	
Total lands acquired or available by purchase only		610,763,183

B. Acquired by or available to individuals free (except for fees):

9. Homesteads:		
Patented	96,495,030	
Pending	39,525,840	136,020,870
10. Timber Culture Act	9,745,434	
11. Scrip to Veterans, individuals, Indians, etc.	1,585,066	
Total lands acquired free		147,351,370

C. Reserves unavailable to individuals:

12. Forest preserves	114,502,528	
13. Indian lands:		
Reservations	70,448,126	87,033,221
Individuals' properties	13,987,360	
Ceded but closed to settlement....	2,597,735	
14. National parks	3,654,454	
15. Miscellaneous reserves (reclamation projects, mineral reserves, etc.)	4,295,002	
Total lands unavailable to individuals		209,485,205

D. 16. Unappropriated	473,836,402
Total public domain, United States	1,441,436,160

the Homestead Act. Even as late as 1904, Theodore Roosevelt's commission reported that "detailed study of the practical operation of the present land laws . . . shows that their tendency far too often is to bring about land monopoly, rather than to multiply small holdings by actual settlers. . . . It is apparent, . . . that in very many localities, and perhaps in general, a larger proportion of the public land is passing into the hands of speculators and corporations than those of actual settlers who are making homes." As one authority has suggested, the famous Homestead Act merely "imposed an unharmonious principle on an old system."²¹ And, at least until the turn of the century, the two systems clashed.

²¹ Gates, "The Homestead Act in an Incongruous Land System," p. 654.

Even so, the effect of the Homestead law during the first generation of its operation must not be underestimated. As early as 1874, homestead patents began to exceed cash sales, and in 1904 they exceeded disposals under all other acts combined. Furthermore, the prospect of free land, however disappointing in reality, must have drawn countless persons west even if they had to buy land when they got there.

TABLE 2
PUBLIC DOMAIN AVAILABLE FOR PURCHASE, 1789-1904

	Acres	
	Before June 30, 1862	After June 30, 1862
Cash sales	178,649,737 actual	97,908,483 actual
Former Indian lands	616,038 estimate	500,000 estimate
School lands	14,058,443 "	55,000,000 "
Swamp lands	15,739,266 "	50,000,000 "
Internal improvements	4,587,863 "	16,000,000 "
Railroad grants	15,962,813 actual	101,587,479 actual
Private claims	25,440,482 estimate	8,000,000 estimate
Private wagon roads, canals, river improvements	5,426,885 actual	4,285,540 actual
Agricultural colleges .....	.....	7,672,800 "
Timber and Stone Act .....	.....	7,596,078 "
Mineral lands .....	.....	1,731,276 "
	260,481,527	350,281,656
		260,481,527
		610,763,183

The Homestead Act, particularly while the frontier line still existed, has thus been usually regarded as a prime cause of westward expansion, yet in view of the facts its efficacy must be questioned and at least carefully qualified. The disposition of land granted to states, companies, and others who eventually sold them to individuals must undergo further scrutiny. What, for example, was the relative effect on westward expansion of the sale of railway, swamp, and school lands? Was it—in comparison with homestead entries—proportionate to the acreage involved or not? To these questions, there are as yet no definitive answers.

Paradoxically enough, in the light of the widely accepted notion to the contrary, more acres have been patented under the Homestead Act since 1904 than before that date, although most of the lands thus patented are distinctly inferior to those taken up in the earlier period. Compared with the 99,916,996 acres patented through 1905, 146,729,785 acres were patented in the years 1906-1940, inclusive. In contrast, over the same period railways acquired only some 15,000,000 acres in addition to those already patented or withdrawn in 1904. Similarly, state grants over the past 35 years have increased only by some 25,000,000 acres, and cash entries under the combined Desert Land, Timber

and Stone, and mineral acts by about the same amount. Meanwhile, reserves, including those for forests, national parks, grazing, and Indian occupation, have increased two and one-half times. Consequently, it would seem that, through an increasingly enlightened land policy during the last generation more free land has been made available in the West, both relatively and absolutely, than ever before and, at the same time, vigorous measures have been taken to preserve national resources for future generations of the nation as a whole and for those of the West in particular.

The Westerner

Our westward expansion has been so complex and its most brilliant chapters so anonymous that the person has never existed who could be called typical of the entire movement. He would, among other things, have to be a Jack-of-all-trades, a combined conservative and radical, a planner and a prodigal, a fighter and a man of peace. Yet there are some personal characteristics that, in the popular mind, at least, personify the West: faith in the region, readiness to accept risk, persistence in the face of hardship, and resourcefulness in overcoming heavy odds. Countless men and women have possessed these traits. Most of them have been little people, members of the unsung army who patiently built the West. Some few have been remembered, usually because, with questionable typicalness, they became wealthy and rose far above their onetime partners, or because they happened to leave voluminous records.

By such men and women, high and low, most of them forgotten, our westward expansion was set in motion. It is continuing today, changed in direction and scope by a new economy based on science, yet in many ways still the most prized and colorful project of all Americans.

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CHAPTER 18

The Emergence of Agricultural Regionalism

Agriculture in Modern Industrialism ¹

DURING THE HALF-CENTURY between the close of the War Between the States and the outbreak of the First World War American agriculture changed from an occupation that was still largely primitive in its technique and organization and to a considerable extent self-sufficing in its economy to a modernized business, mechanized, standardized, and commercialized.² These changes, interrelated with those in other divisions of the national economy, made the farmer a direct participant in modern industrialism. Agriculture, like the nation, was coming of age. The modernizing of the basic interest was due to the same underlying influences that were leading to national consolidation and the emergence of the United States as a world power.

The period was marked by the occupation and utilization of the country's remaining land resources. In 1860 two-thirds of the public domain was still in the possession of the Government; by the first decade of the new century all of the cultivable and most of the grazing areas had passed to private ownership. Additional acres for farming were to be had only by costly irrigation and reclamation projects. The opening of Oklahoma to settlement in 1889 inspired the last great rush of homeseekers into an area relatively suitable for homesteading. From 1860 to 1910 the number of farms was tripled and the number of acres brought into cultivation was more than doubled.

¹ There is no synthesis, even passably satisfactory, of the history of American agriculture since 1860. The publication *Agricultural History* and occasional studies in historical journals such as the *American Historical Review* and the *Mississippi Valley Historical Review*, and in economic journals such as the *Quarterly Journal of Economics* and the *Journal of Political Economy* contribute information and interpretations that help to blaze the trail. L. B. Schmidt and E. D. Ross, *Readings in the Economic History of American Agriculture* (New York: The Macmillan Company, 1925) and T. N. Carver, *Readings in Rural Economics* (Boston: Ginn and Company, 1916) reprint valuable historical articles. The *Yearbook of Agriculture* published by the U. S. Dept. of Agriculture since 1894, provides convenient and reliable statistical information and historical summaries. The most readily accessible bibliographies are E. E. Edwards, *Bibliography of the History of Agriculture in the United States*, U. S. Dept. of Agr. Misc. Publ. No. 84, 1930 (Washington, D. C.) and L. B. Schmidt, *Topical Studies and References on the History of American Agriculture* (Iowa State College, Ames, Iowa, 1940).

² For concise analyses of these changes see L. B. Schmidt, "The Agricultural Revolution in the United States," *Science*, Vol. LXXII (1930), pp. 585-594; E. E. Edwards, *Yearbook of Agriculture*, 1940, pp. 221-266.

The settlement of the Prairies and the Great Plains provided a great opportunity for large-scale, systematized use of machinery. Introduced in the thirties, and increasingly adopted during the War Between the States, by the seventies basic implements for cultivation and harvesting had come to supersede traditional hand methods. In the following years mechanical techniques were extended to the raising of new crops, and the construction and operation of agricultural machinery was progressively perfected. In the first decade of the new century the gasoline tractor contributed the long-sought power element. As in other industries, mechanization resulted in a continuing displacement of labor, an acceleration of operations, and a greater standardization of products. The extent and elaborateness of technical devices and processes varied with the requirements of different regions and their special crops and systems, but the "mechanical man" found a place in all branches of cultivation and husbandry until the expression "the farm, a factory" had an essential justification.

With the extension of farming into new regions of varied adaptability and the accelerated and systematized operations made possible by machinery, there was a steady, if gradual and uneven, improvement in methods. Basic applications of the principles discovered in the biological and physical sciences during the first half of the nineteenth century now brought a trend toward what the English have termed "high farming" as contrasted with the extensive methods of cultivation and husbandry previously used. Here again the advances varied with the region and commodity involved, but the applications of the findings of botany, chemistry, physics, genetics, and bacteriology were in many cases of determining influence. The applications of the social sciences, seriously entered upon in the opening years of the new century, were to be no less influential upon the farming business and upon rural life and institutions. Thus privately endowed and publicly maintained research institutions, intelligent and progressive agricultural journalism, and competent and alert individual enterprise all had a share in the advance of farming.

The extension and co-ordination of a national system of transportation, inaugurated by the completion of the first transcontinental railroad in 1869, provided the means for commercialized marketing of the surplus of the farm and ranch. Increased speed and size of trains, specialized stock and provision cars, and systems of through shipments widened the area of competition for many commodities and thus hastened regional specialization on the basis of the most profitable utilization of land and labor.

Along with modernized transportation there developed the modern marketing organization. The primary grain markets improved their physical equipment and marketing system. The produce-exchange with

its price-stabilizing function came into full operation; the great cotton exchanges were developed in Liverpool and New York City.

These modernized utilities and trading agencies were indispensable in marketing at home and abroad the enormous volume of produce. The statistics of sales, so far as available, reflect the requirements of the modern factory and its workers. Agriculture made a major contribution to the mounting volume of internal trade. Population tripled in the half century, and industrial specialization and urban concentration brought steadily increasing demands for food. By 1900 agricultural production was also providing more than four fifths of the raw materials manufactured.

In these years the export trade in grain and meat reached its peacetime height. From the increasing demand in the sixties the food trade grew steadily until it reached a peak in the first decade of the new century. It is reliably estimated that the United States exported more wheat from 1875 to 1883 than in all the previous 50 years. It is small wonder that the Austrian economist, Dr. Alexander Peez, described the trade in this agricultural surplus as the "greatest economic event of modern times."³ Moreover, by the seventies the South had fully recovered the European cotton trade.

Special Limitations of Agriculture as a Modern Business

Unfortunately, this impressive volume of trade did not bring good times for the farmers. On the contrary, the three decades following the War Between the States were times of stress and strain for most of those engaged in the occupation of agriculture and a period of acute distress for many. Farmers labored under limitations and disabilities in both the production and the disposal of their surplus. In spite of all the advances in farming, the census of 1880 shows that the proportionate share of agriculture in the nation's income was becoming steadily smaller. Thus, early in the new era problems of parity sprang up.

Physical limitations, always an unsettling factor in agricultural production, appeared with increasing effect when farming became a commercial enterprise. The extension of cultivation into the semiarid region of the Great Plains brought recurring seasons of crop failure or ruinous shortage. In addition, deforestation, extreme drainage, and improper tillage led to destructive floods in humid areas. Shortsighted cropping practices exhausted soil fertility, while extreme specialization and careless methods heightened the destructive ravages of plant and animal diseases. In general, adjustments of commodities and systems to the

³ Quoted by William Trimble, "Historical Aspects of the Surplus Food Production of the United States, 1862-1902," *American Hist. Assoc., Report*, 1918, Vol. I, p. 227.

resources of a given region and the selection of the most profitable varieties and breeds for particular purposes were achieved at the cost of much wasteful trial and error.

Financial problems were no less serious and complicated. The farmer of the period following the War Between the States had his problems of surplus production, just as did the farmer following the First World War. Lavish and unplanned disposal of the public lands had not only taken settlement into the subhumid area but had led to the increase of grain and meat production in excess of available market needs. In addition to the problems of relative overproduction, the appreciated gold standard caused a general fall in the price level from about 1875 to 1897. The farmer, by the nature of his investment, was unable to adjust his production to the depressed marketing conditions to the degree that other businesses could.

All regions faced their special difficulties. Eastern farmers had to compete with the cheaper production of the West or restrict their undertakings to narrow specialties. Western farmers were carrying a heavy burden of mortgage indebtedness to Eastern creditors. With the taking up of the available portions of the public domain, the price of land, influenced by speculation, increased disproportionately to the returns that could be obtained from its use. New farmers were seriously handicapped by the necessity of investing a large proportion of their funds in land rather than in equipment and improvements.*

Relatively small returns upon investment and meager compensation for labor and managerial services restricted living conditions on the farm more than those in the cities or even in the larger villages. Educational and recreational opportunities were especially limited. Although social and intellectual standards and outlook varied between regions, there is abundant evidence to indicate that in all rural settlements they showed a decline from former days and an increasing disparity with town conditions. Moreover, in determining state and national policies the farmer was much less influential than he had been before the War Between the States. Policies seemed to be shaped more and more in the interest of the industrialists and financiers, and the abuses of big business were not effectively restrained.

Formative Agricultural Organization

Conditions called for organization; in fact in a society in which all other interests were organized more or less effectively such a policy became a necessity if the farmers were to secure and maintain a relatively favorable position in the economy. But organization presented numerous

*See the revealing record and conclusion in Alvin S. Johnson, "The Farmers' Indemnity," in J. H. Hollander, ed., *Economic Essays in Honor of John Bates Clark*, pp. 215-228. New York: The Macmillan Company, 1927.

difficulties; not only were the traditions of American agriculturists opposed to common action, but the nature and diversities of the occupation created serious obstacles. The very large number of farmers involved, their varied and competing commodity interests, the dispersion of the agricultural population, and the lack of developed leadership were all retarding and inhibiting influences.

Whatever the difficulties of organization, the distress was real and pressing to the point of desperation. Out of the hard times of the years of deflation and transition came the first class-conscious farmers' movements in American history—so serious and persistent in their aims and efforts as to have gained the designation "the agrarian crusade."⁵ Each of the successive movements reflected the particular need and the special center of distress of the time.

The Granger movement ⁶

The basis of the first class-conscious farmers' movement was the Patrons of Husbandry, founded in 1867 as a purely fraternal organization by a group of clerks in Federal bureaus. It was originated by Oliver H. Kelley, a native of Massachusetts who had pioneered in Minnesota. On an inspection trip through the South as an agent of the new Department of Agriculture Kelley became impressed with the need for an organization to bring together farmers of the different regions and to improve the social and intellectual conditions of rural communities. In 1867, with the aid of associates in Washington, he drew up a constitution and ritual for a new order that was to be open to both men and women, and that was to have aims, titles, and ceremonies drawn from farm life. The local branches were known as *granges*. It is a symptom of the temper of the American farmer of that day that such a purely social and benevolent lodge should have been seized upon as the agency for an action-program to bring redress of grievances and relief from prevailing distress.

Although the order was established in all regions, the fullest and most aggressive program was carried on in the upper Mississippi Valley—the "Granger West"—the main center of agrarian distress in the seventies. In addition to the common causes of dissatisfaction, these states had suffered special aggravations. Wheat cropping was bringing the inevitable effect of diminished yields in comparison with the new lands farther to the west whose overextended acreage was tending to depress the market. A heavy volume of indebtedness had been contracted during the period of high prices that accompanied the war boom. These

⁵ For a brief, competent survey see S. J. Buck, *Agrarian Crusade*. New Haven: Yale University Press, 1919.

⁶ S. J. Buck, *The Granger Movement*. Cambridge: The Harvard University Press 1913.

debts became an increasing burden with the approach of resumption of specie payments by the Government and the consequent lowering of the price level. Under the pressure of promotive zeal railroads had been overextended in the Northwest. Without adequate planning and with no regulation of their capital structure, methods, and charges, the railroads indulged in such abuses as watering of stock, unfair reorganizations, discrimination between shippers and between shipping points, and fixing of rates at what the traffic would bear in the more prosperous seasons.

It was their grievance against railroad rates that the aroused farmers most emphasized and attacked most directly. Between 1873 and 1876 "independent reform" or "antimonopoly" parties, organized among the grange members, obtained control of state legislatures and enacted laws to fix the charges of railroads and of warehouse and elevator companies. Railroad commissions were created to administer the regulatory laws. The most complete of these so-called granger laws were put through in Illinois, Wisconsin, Iowa, and Minnesota.

Lack of precedents and adequate information as a basis for operations doomed these regulatory ventures to ineffectiveness. The railroad corporations involved sought to discredit the whole program by exaggerated complaint and reduced service. In any case, it was soon decided that the main responsibility and authority for the regulation of transportation utilities belonged to the Federal Government and not to the states. There was, however, a real achievement in these state enactments: crude, premature, and inadequate as they were, they established the precedent, confirmed by the Supreme Court of the United States, that such corporations were of a public nature and thus subject to governmental regulation.

Hardly less irritating were the farmer's grievances against the middleman—the commission merchant, the wholesaler, and various distributive and credit agencies. Co-operation, it was felt, would eliminate superfluous or predatory charges imposed by these groups. Buying and selling agencies were set up by local granges with a fair degree of success. The first of the large general mail order houses, Montgomery Ward and Company, was organized to sell to the granges. Stores were established on the Rochdale plan of distributed profits, but this system did not appeal to the Middle Western American farmer as it had to the English workingman. Credit associations and fire insurance companies, however, when well managed and kept within conservative limits, rendered moderate service.

Especial hostility was felt toward the manufacturers of harvesters, who concertedly refused to cut their prices for grange buying agencies. Again a remedy was seen in co-operative action. In Iowa the state grange bought a patent for a harvester that could be put on the market

for a price estimated at half that of other machines, and undertook quantity production. With accumulating funds, the national grange bought up patent rights for a full line of farm and household implements and planned to establish factories in seven states. Such a pretentious industrial program was ill considered. Trouble developed in the operation of the machines, and litigation arose over the infringement of patents. The Iowa factory failed in its second year and brought ruin to the treasury of the state grange, and most of the other ventures in productive co-operation were soon suspended with disastrous liabilities. Nothing did more to discredit and hasten the decline of the grange movement in the Northwest than the failure of these co-operative undertakings. With all their cost, however, these experiences afforded valuable lessons at the time and later in showing the possibilities and the limits of a co-operative modification of wholly private business institutions.

The social and educational activities and influences of the granger movement were generally wholesome and inspiring. Local meetings provided an opportunity for regular social relaxation; and lectures and discussions furnished information and stimulated thinking. The state and national granges advocated improved rural schools and the increased support of agricultural colleges, according to their rather narrow conceptions of the methods and curricula of such institutions. But these activities, although they were to be the most enduring, attracted the least public attention.

Premature or ill-considered political and economic programs adopted by the granges brought a decline of membership as rapid and spectacular as its growth had been. On the political side, dissolution was hastened by the insistent greenback issue that, as will be presently noted, divided farmers no less than laborers. The independent agrarian parties, formed primarily to regulate corporations, were confronted in the national election of 1876 with the alternative of returning to the old parties or merging with the national greenback organization.

The greenback panacea⁷

From the late sixties there was political agitation to check deflation by preventing the contraction of the supply of greenbacks and by redeeming war bonds in legal tender. The proposal for this type of price stimulation was directed mainly to the Midwestern debtor-farmers and to the Eastern laborers. This extreme inflationist panacea, however, never made a wide appeal to the farming interest, and most of the independent parties were opposed to it. Two of the three Presidential candidates (1876-1884) nominated by the Greenback party represented

⁷ C. O. Ruggles, "The Economic Basis of the Greenback Movement in Iowa and Wisconsin," *Mississippi Valley Historical Association, Proceedings*, Vol. VI (1912-13), pp. 142-165.

labor rather than agriculture; only James B. Weaver, the standard-bearer in 1880, could be classed as an agrarian. In spite of distress that at times reached the point of desperation, such intransigent proposals failed to gain the general support of a basically conservative proprietary class. But the distress grew acute and cumulative. A price recovery in the early eighties proved temporary and illusory. Organized effort, consequently, appeared imperative; and, whatever the form of such combined action, increasing consideration must of necessity be given to the vital problems of currency, credit, and the marketing system.

The alliances ⁸

In contrast to the initial movement of the granges, the agrarian crusade of the eighties was characterized by the number and spontaneity of farm organizations. The difficulties of the small farmers and tenants of the Southwest and of the wheat farmers of the new Northwest, who were experiencing the perils of settlement beyond the line of adequate normal rainfall, led to a variety of local organizations that were eventually combined in two regional societies. The Northern groups were merged into the National Farmers' Alliance (generally known as the Northwestern Alliance) and the Southern into the National Farmers' Alliance and Co-operative Union of America (the Southern Alliance). Efforts to bring the two combinations together failed. They differed somewhat on economic and political proposals; the Southern Alliance was regarded as more aggressive and extreme. There were, however, serious competing commodity interests, as those between lard and cottonseed oil.

The Alliance programs placed main emphasis upon co-operative activities, but it was increasingly evident that such limited correctives and palliatives were wholly inadequate to deal with the central problem of steadily falling purchasing power. The most original and constructive of the proposals of the Southern Alliance was for a Federal system of county warehouses and elevators where the leading crops might be deposited in return for negotiable certificates and in exchange for loans in legal tender up to 80 per cent of the local price of the products. Interest on the loans was to be one per cent per annum and the farmer was to be given a year in which to market his products. The scheme of the Northwestern Alliance for increasing the currency proposed a Federal land-loan bureau that would make loans upon agricultural land up to one-half of its appraised value at two per cent per annum, with the privilege of payment at any time within 20 years. Both proposals were too far in advance of public thinking on Governmental policy and economic theory to get any serious consideration.

⁸J. D. Hicks, *Populist Revolt*. Minneapolis: University of Minnesota Press, 1931.

While the leaders of both of the alliances emphasized that their function was business and not politics, the memberships, under stress of the times, participated more and more in elections, either in third-party demonstrations with labor groups or in coalition with one of the main parties. As a result of such policy, in the landslide election of 1890 the Alliance forces helped to secure the election of half a hundred representatives in Congress, four United States senators, and three governors, and obtained the balance of control in a dozen state legislatures. Eventually, too, the national organizations formulated the equivalent of a party platform; in fact, the resolutions of the St. Louis convention of 1889, at which both alliances were represented, were an anticipation of the basic issues of the People's party. The transition thus prepared the way for the greatest of agrarian political efforts in the Populist movement.

People's party^o

The economic status of the American farmer in the era before the Great Depression of the 1930's reached its nadir in the early nineties when farm prices fell far below the cost of production and when farm incomes could not meet obligations of indebtedness. As in the case of labor in times of depression, the farmers turned from economic organization to direct political action. The situation, they felt, called for drastic reform and for relief by the national Government. The answer was the most influential third party in our history before the Progressive revolt in 1912. The People's party, shortened to Populists in common usage and to "Pops" in journalistic derision, reflected the denunciations and demands of the farmers, the disparity in security between farming and other occupations, the plight of the homesteader on the "Last Frontier" caught between the millstones of deficient crops and falling prices, and the distress of the Southern tenant held in the vicious share-crop cycle. So great and general was the protest in the disaffected sections that in the election of 1892, the party, under the leadership of the "grim, gray, and deadly serious" General Weaver, polled over 1,000,000 popular and 22 electoral votes. Two years later, with hardship intensified by the panic, the new party elected seven representatives and six senators to voice their protest and to urge the passage of the farmers' charter in Washington.

The economic platform of the Populists had three main planks: reform and regulation of the disposal of the public domain in the interest of the actual settler; strict corporation control with public ownership and operation of transportation and communication utilities; and, mainly, the raising of the price level through an exclusive and liberal

^oJ. D. Hicks, *Populist Revolt*.

system of Federal note issue and the restoration of the free coinage of silver at the old ratio of 16 to 1. Under existing conditions of production of the metals this step would have meant in effect not bimetallism, but rather the substitution of a cheap silver for a dear gold standard.

On this paramount issue the party staked its life in coalition with the dominant element of the Democratic party under the leadership of William J. Bryan in the "battle of the standards" in the campaign of 1896—the Populists lost. The determining cause of the defeat of the young leader who was able to voice so eloquently and sympathetically the cumulated protests and prejudices of his section has not been generally understood. The heated, not to say hysterical, opposition of the industrial regions by all of the ingenious resources known to current political manipulation, augmented by those of the new business organization, was to be taken for granted. But most of this effort and expenditure resulted in making assurance doubly sure in the creditor-minded areas. The rejection of Bryan and his program was due not to the strength of the financial East, but to the candidate's failure to hold his own territory—the states that previously had shown a strong sympathy for his cause and that from natural interest might have expected to profit by the program. In the crucial showdown, the border state of Kentucky, the Western farm states of California, Oregon, North Dakota, and Minnesota that had hitherto strongly favored the Populist doctrines veered to the side of "sound money."¹⁰

Evidently the West, especially the Middle Border and the Pacific Coast areas, in growing up was becoming conservative.¹¹ Iowa, for instance, the most agricultural of the states, a pioneer granger state and the home of Weaver, the greenback and Populist leader, provided an outstanding example of the conservative reaction. The protest vote was far below that of previous years. The gold-standard appeal was made most notably by the lawyer-banker, Leslie M. Shaw, a Vermonter who had made his way through a prairie college by selling fruit trees and who had supplemented his law practice by a farm loan business supported by funds from New England savings banks. His argument was presented by the academic device of charts and proved to be more appealing to the Hawkeye farmer than the eloquent periods of the "Boy Orator." Shaw himself, after two terms as governor of his state, was to be transferred from his country bank to the leadership of the Federal Treasury Department. In contrast, the ultraconservative Sterling Morton of Nebraska inveighed in vain against "Bryanarchy" and the "Popocrats."

¹⁰ See the detailed map in C. O. Paullin and J. K. Wright, *Atlas of the Historical Geography of the U. S.*, Plate 108. Washington, D. C.: Carnegie Institution, 1932.

¹¹ Compare the suggestive contemporary essay (Sept., 1896) by Frederick J. Turner reprinted in *The Frontier in American History*, pp. 205-221. New York: Henry Holt and Company.

The pioneer areas still maintained the debtor reaction to hard times. But, as it proved, the winter of discontent, even for the frontier, was passing, and the spring of hope was on the way.

The Farmer in the "New Prosperity"

For about a decade and a half from the closing years of the old century and the first of the new, the price level steadily mounted, and general business activity made appreciable advance. Previous influences were largely reversed. The monetary standard was cheapened through the increased production of gold, and at most points demand for farm products came abreast or forged somewhat ahead of available output. Primitive natural abundance of the virgin frontier and the open range went the way of exploited mines, depleted forests, and fished-out waters. Cheapened production for the future was dependent upon technological processes and business management. For the time being the problem of the high cost of living (the "H.C.L." of the journalist) replaced that of falling prices; indeed, it became a tonic to the whole business situation, giving it an optimistic outlook, in spite of alleged abuses and recurring financial flurries. Agriculture shared in *Our New Prosperity* that Ray Stannard Baker pictured so vividly and attractively in 1900. Even the Populist West, through more understanding adjustments and adaptations and by aid of the recurrence of a seasonal recuperative cycle, attained to greater stability and security, with consequent effect upon regional attitude and outlook. In the prevailing good times, agriculture, like labor, emphasized political action less and economic organization more. There remained, to be sure, the underprivileged and submarginal small holders and tenants to whom the co-operative programs of the Farmers' Union and the Society of Equity made an especial appeal. The tendency toward adjusted production of commodities and controlled marketing significantly foreshadowed future policy. No less significant were the efforts at federation along general or allied commodity lines.¹²

The Problem of Future Organization

By reason of inexperience and the pressure for immediate emergency action, the agrarian movements had been largely episodic in emphasis and opportunist in aims. Their spokesmen, concerned with this or that panacea, had failed to face squarely and realistically the fundamental issue as to whether agriculture in the new industrial age was to be in a position of relative parity with other interests or was to be definitely and permanently subordinated to them. With extended and

¹² Edward Wiest, *Agricultural Organization*. Lexington: University of Kentucky, 1923.

costly findings of trial and error during the lean years, and with the opportunity in the relatively fat years to plan for the future, it remained to be seen if a far-and-broad-visioned leadership would develop, and on what basis and to what extent the varied and at times competing interests within the occupation could be united. In any case, it was already becoming evident that the effectiveness of organized groups, general and special, would depend to no small degree upon their ability to ally and harmonize their programs with those of public agencies that were expanding in response to an awakened public opinion. The Farm Bureau was to be developed during the First World War largely as an agency of voluntary co-operation with Governmental services.

Governmental Activities

Early neglect

The agricultural well-being of a nation with abundant natural resources increased by each successive addition of territory was long taken for granted. Consequently, public aid to agriculture was slow and retarded. Factories had to be established and maintained by special effort and sacrifice; transportation, home and foreign, must, it was felt, be subsidized. In contrast, land was regarded as almost in the nature of a free good, and Americans were given the confident assurance that Uncle Sam was rich enough to provide all of his children, native-born and adopted, with family-size farms. A yoke of oxen, a clumsy wagon, a crude plow, and hand implements of neighborhood fabrication were all that the tough-muscled and stronghearted pioneer presumably required. As late as 1862, in the debate on the land-grant college bill, Senators argued that all the Western farmer desired from Government was to be given a homestead, and to be left alone. In full accord with this view, Federal policy up to that time had been devoted mainly to furthering exploitive efforts by a system of land disposal as loose as it was liberal.¹³ With a settlement system adjusted increasingly to regional desires and with imperial grants to corporations, the domain was alienated, with no safeguard against speculation and with a total lack of scientific classification of land areas or of other forms of planning.

State policies

The aid of the states before the War Between the States was limited mainly to modest grants to agricultural societies for conducting their exhibitions. By the fifties a few states had appointed boards that collected, with more or less care and competence, statistics and other

¹³ The best general histories of the public lands are B. H. Hibbard, *History of Public Land Policies* (New York: The Macmillan Company, 1924) and R. M. Robbins, *Our Landed Heritage, The Public Domain* (Princeton: Princeton University Press, 1942).

bits of information supposedly of interest and pertinence to the farmers. The extension of regulatory supervision of the dairy, canning, meat and other food production and processing industries, and the systematic combating of animal and plant diseases necessitated a more definite and permanent type of administrative authority. Accordingly, state departments of agriculture began to be created in the seventies.¹⁴

United States Department of Agriculture

Similar needs in the realm of national jurisdiction gave to the Federal department its first important functions. Before the War Between the States the only national agency for agricultural improvement had been a clerkship in the Patent Office for which small appropriations were made from 1839 on for collecting and distributing seeds and assembling statistical and other more or less informative material to be put into the annual report.

In 1862, as a part of the free-soil economic program,¹⁵ a separate Department of Agriculture with restricted functions and headed by a commissioner was created. The early activities of the Department were devoted mainly to introducing and establishing new products, such as sorghum and beet sugar, tea, silk, hemp, and jute. Old abuses in seed distribution lingered, and much of the statistical and advisory material collected and published was of doubtful authenticity and availability. The Department's chief contribution in the early years lay in the research projects inaugurated by certain technically trained members of the staff, even though their work was hampered by hesitant administrators and rapacious politicians. With the establishment in 1884 of the bureau of animal husbandry to administer the meat inspection laws, the regulatory powers of the Department became of first importance.

By 1889 the increase of functions and the potential threat of agrarian unrest and party disaffection led to the raising of the Department to full executive rank and the creation of a Secretary with membership in the cabinet. Such a change was opposed by Senators who felt that the proposed Department, in contrast to all the others, would be concerned exclusively with technical matters and not at all with determination of policy, and by the Attorney General who, with obvious lack of understanding of existing activities, felt that the new Secretary's time would be taken up largely in answering such questions as those having to do with the proper time of the moon in which to plant potatoes.¹⁶

From the start experience proved that there was no lack of policies of

¹⁴ See Wiest, *Agricultural Organization*.

¹⁵ A concise analysis and appraisal of the economic program during the War Between the States is given in E. D. Ross, "The Civil War Agricultural New Deal," *Social Forces*, Vol. XV, pp. 97-104.

¹⁶ H. B. Learned, *The President's Cabinet*, pp. 335-338. New Haven: Yale University Press, 1912. Allan Nevins, *Grover Cleveland*, pp. 362-363. New York: Dodd, Mead, and Company, 1932.

material concern and of provocative nature clamoring for the attention of the Department, and that the Secretary and his expanding staff were in no danger of wasting their time with trivialities.¹⁷ The rapid and profound changes in the farming occupation brought a multiplication of bureaus and agencies having to do with the promotion and protection of all aspects of the agricultural enterprise and with the conduct of state relations. The latter involved very largely Federal aid for education and research.

Agricultural Education and Research

The foundation of serious instruction in agriculture was laid by another of the free-soil measures of the notable Congressional session in the spring and summer of 1862: the Morrill Act, granting land endowments to state colleges offering courses in agriculture and mechanic arts. Half a dozen states had already made provision for colleges of agriculture, and in at least three instruction was being given in an elemental manner. But the Federal grant gave the needed incentive for the founding in each state of the peculiarly American institution, the land-grant college.¹⁸

Great and far-reaching as the achievements of these colleges were to be, they were slow in finding their particular place and function. A long and heated controversy ensued between the advocates of practical training of farmers and artisans, with required manual labor as the central feature of the course, and those who would train leaders in technology upon a broad basis of science inculcated by the laboratory method introduced from European universities. In either case there were lacking an organized body of knowledge and teachers capable of imparting it.

Experiment stations ¹⁹

The turning point came with the organization of experimental work, started in the states and systematized and standardized by the Hatch Act of 1887. Such aids and incentives by the Federal Government to the creation of better varieties, breeds, methods, and techniques were in part an offset and a corrective influence to the wasteful and disorderly practices of cultivation and husbandry encouraged and promoted by the careless and prodigal alienation of the public lands culminating in the Homestead Act of 1862 and its supplemental extensions. A nucleus of

¹⁷ J. M. Gaus and L. O. Wolcott, *Public Administration and the United States Department of Agriculture* (Chicago: Public Administration Service, 1940) is a thorough administrative study that gives unusual attention to historical origins and backgrounds.

¹⁸ The fullest history of the land-grant college movement is in E. D. Ross, *Democracy's College*. Ames, Iowa: Iowa State College Press, 1942.

¹⁹ A. C. True, *A History of Agricultural Experimentation and Research in the United States*. Washington, D. C.: U. S. Department of Agriculture, 1937.

teachers and research workers was recruited from the body of native scientists educated in old-line colleges and medical schools, from among American students trained in European universities, immigrant scholars, and, gradually, graduates of the first of the new colleges.

The research carried on at the stations more than any other of the activities of the land-grant colleges won recognition from scientists and from farm leaders. The dirt farmers were slowly reconciled and conciliated to the program by the presentation of practical short courses and farmers' institutes. The beginnings of systematic extension work appeared during the first decade of the century in club work in the South and the emergence of county agents.²⁰ In the same period vocational education was finding an assured place in the rural high school.

Federal-State Co-operation

Meanwhile, the technical and administrative personnel of the Federal service was being drawn more and more from the student groups of land-grant colleges, and forces were getting under way that would lead to the large inclusive programs of Federal-state co-operation. The revolution in social and political opinion that would make possible such an extension of public functions and such a degree of centralized control awaited the pressure of modern agricultural distress; in extent and complexity this change of thought was as radical as the nature and degree of the relief sought. In the broader realms of regulation, research, and education, basic foundations had been laid, although the problems of more positive aid—credit, marketing, price-fixing, rural living, and social security—were hardly more than glimpsed and no concerted demand for action had been made.

Without the visions of spectacular enrichment that attended the fabulous inflations and imputations of the First World War, American agriculture by the time of the first Wilson administration had come of age. The promises of the frontier were gone; elementary adjustments had been made; and the main occupational groupings with their special needs and opportunities had become fixed. In the process, agricultural production had become increasingly localized.

The Main Agricultural Regions ²¹

From the adaptation of systems of production to environment a geographical specialization had slowly been reached, one that had pro-

²⁰ A. C. True, *A History of Agricultural Extension Work*. Washington, D. C.: U. S. Department of Agriculture, 1928.

²¹ The most usable and available description of the different regions is a series of articles by O. E. Baker, "Agricultural Regions of North America" in *Economic Geography*, Vols. II-VI (1926-1930). *The Atlas of American Agriculture* (Washington, 1936), prepared by the Department of Agriculture under the direction of Dr. Baker, provides an elaborate and minute representation of all the environmental influences involved.

ceeded from haphazard trial and error to careful experimentation and planning, both by private initiative and public aid. New varieties, new crops, wars, unexpected disasters or opportunities might demand shifts and readjustments from time to time, but compared with the earlier tentative and unstable areas the modern belts of production were to prove relatively fixed and enduring. Each was to be dominated by one commodity, grown in connection with subordinate products and with limited areas in which some specialty had local preference. As in the case of the localization of manufacturing industries, regional dominance of agricultural commodities has resulted from the most strategic combination of advantages in production and distribution, advantages that were both physical and social. In this regional adjustment and adaptation the number of new products introduced was relatively small. Localization involved readjusting and systematizing the old enterprises in accord with scientific methods, mechanization, and market demands.

Subtropical Belts ²²

The distinctive geographical features of the Gulf Plain from southeastern Texas to southern Florida—high humidity, mild climate, fertile soil in the delta and coastal prairie of Texas and Louisiana and thin sandy soils in the rest of the area—have determined the characteristic crops and systems of this subordinate, largely undeveloped belt.

Rice

The coastal prairie of southeastern Texas and southwestern Louisiana, an area of from 25 to 50 miles in width and some 250 miles in length, proved uniquely suitable to the cultivation of rice. Its advantages were to establish the industry much more securely than it had been in the old Carolina-Georgia Tidewater area of production. In the 1880's settlers from the grain-growing Northern Prairies settled these Southern Prairies and started growing rice on a large scale. Irrigation was easily and naturally provided by artesian wells or pumping stations. A Japanese variety of rice introduced by the United States Department of Agriculture flourished. The labor-saving machinery of the grain area was utilized in the cultivation and harvesting of the crop, and the cost of production was so reduced that the surplus could be sold in the Orient in competition with the native product. A student of human geography has strikingly summarized the relocation and reorganization of produc-

²² E. Q. Hawk, *Economic History of the South*. New York: Prentice-Hall, Inc., 1934. A. E. Parkins, *The South*. New York: John Wiley and Sons, 1938. R. B. Vance, *Human Geography of the South*. Chapel Hill: University of North Carolina Press, 1935.

tion of an old staple: "A fortunate complex of geographic factors thus made possible the adjustment of the steel robots of the wheat field to an aquatic plant in a startling agricultural development. . . . If the tradition of slavery once clung to the rice farming of the Carolina coasts, it was long since removed by wheat farmers from the Northwest." ²³

Sugar cane

Sugar cane remained strictly localized in the Mississippi delta of Louisiana. In slavery days the production of this staple was undertaken on the largest plantations, and after the War Between the States cultivation continued on a large-scale capitalistic basis. Equipment for a large plantation or a unified group of production units included a central mill and a private railway line to transport the cane. The unusual seasonal labor demand was supplied largely by roving Negro and immigrant workers.

Since domestic consumption of the home-grown cane was very small, the large, if concentrated, enterprise was closely dependent upon tariff rates. The duty of 2½ cents per pound on unrefined sugar from 1873 to 1890 had a stimulating effect. The McKinley Act of 1890 put the product on the free list, but compensated with a generous bounty for the native producer. This direct subsidy was replaced in the Wilson Act four years later by an ineffective *ad valorem* duty, and with markets glutted from tropical sources a ruinous competition ensued. The Dingley "high tariff" of 1897 brought protective rates to a new peak but further difficulties came with the admission of sugar from the country's new possessions, Porto Rico and the Philippines, and as a result of a reciprocity agreement with Cuba. From this cumulative depression the sensitive industry was rescued for several seasons by the First World War. The sugar bowl area was thus unique in its concentration, organization, and insecurity of market.

Fruit and vegetable areas

Less spectacular but of increasing importance were the fruit and trucking crops. Winter vegetables and citrus fruits flourished throughout the Gulf and lower coastal areas, and the trucking belt extended up the coast to New Jersey. The citrus fruits of Florida provided the chief competition to those of southern California, whose irrigated "sun-kissed" valleys, after trial of more general staples, were concentrated on these specialties as the most effective utilization of their precious soils. Such specialties entailed their own problems of marketing—of grading, advertising, merchandising, and shipping. The growing demand for them reflected a far-reaching change in national dietary habits.

²³ R. B. Vance, *Human Geography of the South*, pp. 216, 219.

The Cotton Belt ²⁴

The strong demand for cheaper textiles in the years following the War Between the States, and the transformation of cottonseed from waste material to a valuable by-product in the manufacture of fertilizer, feed, and oil expanded the borders of the old Cotton Kingdom westward into Texas to the subhumid line, and northward into Oklahoma, Arkansas, and Tennessee to the frost line. At the same time the application of commercial fertilizers in increasing amounts revived old areas in the Carolinas and Georgia.

Localization in the expanded region was by 1880 paralleled and encouraged by the establishment of cotton manufacturing in the southern Piedmont. With the advantages afforded by easily accessible raw material, natural power, and cheap labor supply, the Southern mills took the lead in the production of the cheaper grades of cloth, and, in striking contrast to former times, fabricated more than half of the cotton crop in the region of cultivation. Indeed, the integration of cotton fields and cotton mills was one of the essential features of the "New South." But both fields and mills were subject to limiting and disturbing influences. In the decade following Appomattox, the transition was made from cotton growing under the plantation organization to the production of the staple upon small units of land operated under a share-cropping system. This rather desperate expedient was resorted to only after the failure of efforts to keep the plantation organization intact by the use of the hired labor of freedmen or immigrants. The tenant's share of the return from the main crop—almost as varied as the apportionments of the catch to the whalers in *Moby Dick*—ranged in practice from one-fourth to two-thirds, depending upon the share-cropper's investment in the farm enterprise. In some cases the landlord supplied everything but the labor. Thus the cotton-growing tenant often occupied a position midway between crop tenancy proper and hired labor service—hire in many cases for most uncertain wages.

An essential and determining characteristic of the new tenancy was the crop lien by which the landlord-merchant staked the cropper his necessary living supplies—the "pawn-shop system" of credit, as Kendrick and Arnett term it. The owner in turn was carried by the country banker. The procedure was uneconomical and in the long run unsatis-

²⁴ In addition to the references on the South already cited, see E. E. Edwards "Historical Background of the Present Situation in Southern Agriculture," Southeastern Economic Association, *Proceedings*, 1930, pp. 78-93; B. B. Kendrick and A. M. Arnett, *The South Looks at Its Past* (Chapel Hill: University of North Carolina Press, 1935); and the older standard studies of M. B. Hammond, *The Cotton Industry* (New York: The Macmillan Company, 1897); and "Cotton Production in the South," in *The South in the Building of the Nation*, Vol. VI, pp. 87-103 (Richmond, Va.: Southern Historical Publications Society, 1909).

factory to all the parties concerned. The tenant paid high prices for inferior goods and was often bound to the landlord by accumulated annual deficits. Diversification either for the market or for subsistence was discouraged, as cotton represented a standardized marketable commodity and generally kept the tenant dependent. Share cropping as a system provided no agricultural ladder up which a farmer could climb to higher and more secure status. The enterpriser, in spite of his exploitive exactions, found his returns fluctuating and uncertain. Production was inefficient, the cotton market wavered from unsteady to weak, while costs remained relatively high. The banker charged exorbitant interest rates for risks that he found ruinous in times of depression. Falling prices and restricted credit in the eighties and nineties hit the cotton grower of the South as hard as they did the wheat grower of the West.

Diversification of crops in the cotton region was an objective that antedated, attended, and followed the War Between the States, but the peculiarities of cotton growing under both slave labor and cropper labor made systematic and planned rotation difficult. There were and always had been subordinate crops and enterprises throughout the region, it is true: corn and pork were the most general stand-bys. Corn was used not only for feed but to an unusual extent for human consumption. In times of special depression of the cotton market, the corn acreage was markedly increased.

The greatest challenge to the dominance of cotton and the most severe threat to the existence of the Cotton Belt came neither from competing areas without nor from rival crops within, but from the ravages of a devouring beetle that imperiled cotton growing on a commercial scale. The boll weevil crossed the border into Texas in the nineties and in the following years became such a menace to the cotton plant that M. B. Hammond, the historian of the cotton industry, wrote in 1909 that "the future of cotton production in the Southern States is threatened unless means are discovered of reducing the losses caused by this pest."²⁵

To offset the losses inflicted by the insect, cotton growers turned to a substitution and diversification of crops that have been publicized out of proportion to their importance for regional economy. The main attack sought to protect the dominant crop by introducing hardier varieties of cotton and improved methods of cultivation. In this campaign for agricultural improvement in the Cotton Belt, the foundations of modern extension service were laid by Dr. Seaman A. Knapp, agent for the United States Department of Agriculture, and representative of the General Education Board. Innovations and defensive compulsion brought diversified rotation into certain areas; for the region as a whole,

²⁵ M. B. Hammond, *The South in the Building of the Nation*, Vol. VI, p. 101.

however, the staple retained its dominant position and cotton still ruled its particular kingdom.

Tobacco Area ²⁶

Tobacco, the oldest of the Southern staples, continued to be grown widely according to the local adaptability to varieties sought by the trade. The cultivation of the main types, however, came to center in a limited area that was to constitute a subregion of the Winter Wheat and Corn Belt. The location was in one case an extension of the production area of 1860 and in another the development of a new area of cultivation. The heavier dark burley tobacco demanded by foreign markets became more firmly entrenched in western Kentucky. The bright-leaf, flue-cured variety, the natural cigarette tobacco, became the major crop in expanding fields in northern and eastern North Carolina. Liberal use of fertilizer produced fairly satisfactory yields upon thin or partially depleted soils. Meantime, the great centers of manufacture at Durham and Winston-Salem sprang up in proximity to the supply of the leaf.

The steady demand for all forms of tobacco put production on a high and mounting level, but the business had its drawbacks and limitations. Cropping involved risks; the tobacco plant is exacting in its cultivation and soil-depleting in its effects. In large portions of the area share tenancy and crop lien prevailed. Concentration of the manufacture of tobacco products in a few large corporations set controls on standards and price. Certain varieties suffered from foreign competition. But by the time of the First World War—during which the demand for cigarettes was to reach phenomenal proportions—the tobacco staple in its leading commercial types was as definitely and firmly localized as was the cotton.

Hay and Pasture Regions—The Dairy Belt ²⁷

Specialized transportation—and through routes—brought the bulk-food products of the West, raised at relatively low cost, into competition with the limited supplies grown in the East. The farmers of New England and the Middle Atlantic states were thus forced into specialized branches of cultivation and husbandry that demanded a greater amount of labor and a more intensive use of the available land in producing commodities with an assured and expandable market. Something of the

²⁶ The most convenient account of the history of tobacco cultivation is in the U. S. Dept. of Agriculture, *Yearbook, 1919*, pp. 151-175.

²⁷ There are very few reliable studies on the history of dairying. *Successful Farming's* "Ten Master Minds of Dairying" (Des Moines, Ia.: Meredith Publishing Company, 1930) is a convenient summary of leading figures in the industry. Edward Wiest, *The Butter Industry in the United States* (New York: Columbia University Press, 1916) is in part historical. E. P. Prentice, *American Dairy Cattle* (New York: Harper and Brothers, 1942) is the most convenient work on the subject.

same problem confronted the tier of states to the westward along the Great Lakes and north of the prairies proper—central Michigan, Wisconsin, northeastern Iowa, and central Minnesota. Hay and forage crops flourish naturally in this region; its climate and situation is admirably suited to dairying, in which its Eastern and Scandinavian settlers excelled. The entire region from New England to Minnesota, with scattered special areas intervening, became predominantly a dairy belt. With the growth of industrial centers the eastern portion of the belt gave increasing attention to the production of fluid milk for the metropolitan markets. Wisconsin, which after the decline of wheat growing had turned to dairying, became the leading cheese-producing state. Dairymen in Iowa and Minnesota specialized in butter making.

The progress of the industry between 1880 and the First World War was attended by notable achievements in production, processing, and marketing. The experiment stations in the dairy states conducted extensive studies of the problems of dairy husbandry and industry. Special dairy breeds were introduced and highly developed for the qualities sought. The efforts to breed "dual purpose" cows, profitable both for milk and beef, proved ineffective. Instead of trying to develop "milk strains" in breeds primarily of the beef type, dairymen introduced dominant milk breeds. From widely scattered dairy centers of Europe they imported Channel Island Jerseys and Guernseys, Scotch Ayrshires, Brown Swiss, and the increasingly popular Dutch breed of Holstein-Friesians. The experiment stations worked out problems of feeds and feeding methods for milk as well as for beef production. By 1890, after a decade of experimenting, farmers accepted the ensiling process as the most effective method for the complete utilization of the corn plant. New forage crops, especially clovers, were introduced to supplement the corn ration and for soiling purposes where pastures were deficient.

The handling and processing of milk and its products were revolutionized by the findings of chemistry and of bacteriology. The perfecting of the condensing process invented by Gail Borden and the production of milk powders gave rise to major industries. Two epochal inventions have affected the development of all phases of the industry: the first centrifugal cream separator brought out in 1878 by the Swedish scientist, Carl G. P. DeLaval, and a simple, dependable butter-fat test perfected by Dr. Stephen Babcock at the Wisconsin experiment station in 1890. Like other branches of agriculture in these years, dairying was lightening and speeding up by machinery its most laborious operations. During the labor shortage induced by the War Between the States, Orange Judd, prominent agricultural editor, replied facetiously to a correspondent that he knew of no machine for milking except the human hand. Before the First World War this most burdensome and

exacting task of dairy routine was successfully performed by mechanical means.

Dairying has been notable for early organization of producers in the different branches of the enterprise and for relative success of co-operation in processing and marketing its products. Early enactment by state legislatures and by Congress of laws for establishing standards and for affording protection against substitute products attests to the standing and influence of the industry.

In spite of the exacting and confining nature of the work and the fluctuations in return for labor and investment, caused chiefly by difficulties in the adjustment of the cost of feed to the prices of the products, the dairy business enjoyed distinct economic advantages and security. Returns were regular and more dependable than those of a one-crop staple. The rotation involved in feed production maintained soil fertility. The dairy region was characterized by a relatively advanced and stabilized economy with enlightened social standards and institutions.

The industry in general could point not only to its achievements but to its great possibilities. The market for its products was growing and extending. The new national dietary habits referred to in connection with citrus fruits and vegetables placed a high value on the products of the dairy and were to rate them even more highly as nutritional studies already well under way in the laboratories of Babcock, Hart, Steenbock, and McCollum were popularized, and as the average consumer became concerned with vitamin content and calorie balance. As it was, the dairy lunch became increasingly popular, and the household larder was replenished from the creamery at the expense of the butcher and the miller and the growers of meat and grain.

The Wheat Belts

An invariable accompaniment of the settlement of each successive frontier has been the movement of the characteristic frontier crop, wheat. By the time of the War Between the States the center of production had shifted from the Appalachian Valley to the Prairies. In the census returns from 1859 to 1879, Illinois was first in production. But with the growing diversification of the Prairies and the northwestward movement of spring wheat, Minnesota led in the returns of 1889 and 1899, in turn to be superseded by North Dakota in 1909. Following the gang plows' encroachment on the grazing area during the First World War, Kansas took the lead decisively in 1919.

Two main wheat belts developed in accordance with the composition of the grain and the conditions necessary for its growth. In the Corn and Winter Wheat Belt, the staple was combined with a corn and livestock economy. This belt occupied in general the border region between the

Cotton and Corn belts, at points overlapping them. California, following a spectacular wheat boom, was by the nineties changing to the cultivation of fruits and other specialties.

A newer and more extended region was that of hard spring wheat stretching from the northwest border of the Prairies to the furthest limit of requisite humidity and occupying detached irrigation areas and the valleys of the Pacific Northwest. The extension of the Wheat Belt westward and northward followed upon development of new varieties of wheat and innovations in methods of cultivation. In the late nineties Mark Alfred Carleton, cerealist for the Department of Agriculture, introduced from Russia strains of durum wheat that proved unusually resistant to drought and rust. Early in the new century, after long trial, the Canadian scientists, William and Charles Saunders, developed the Marquis cross, which was of unusual hardiness and ripened earlier than varieties previously grown.²⁸ Dry farming, tried empirically in various early settlements in the semiarid region, was systematized by H. W. Campbell, who devised an implement for packing the subsoil and who practiced surface pulverization and fallowing. When and where minimum precipitation was sufficient, paying crops might be obtained every two or three years from lands previously unproductive.

In all such extensions of the cultivable areas, whether due to selected varieties or adapted methods, there remained always the danger of unjustified encroachment upon the grazing area beyond the line of safety in farming. On the other hand, if the new area proved highly productive, there was the risk, in the case of a product as widely grown as wheat, of oversupplying the market. The wheat farmers of the Populist West had to compete with those of Canada, South America, and other new areas. Consumption of the staff of life decreased as a result of the competition of fruits and vegetables and milk products.²⁹ In both production and marketing the greatest stability of wheat was assured by a system of established rotation—corn and livestock, for example.

In all modern small-grain production, mechanization has exercised a determining influence. The chief addition to the basic harvester principle was the perfected self-binder. After unsatisfactory trials of wire

²⁸ An informing but highly colored account of wheat improvement is given in Paul de Kruif, *Hunger Fighters* (New York: Harcourt, Brace and Company, 1928) Book I.

²⁹ The most scientific findings on this subject are in the publications of the Food Institute of Stanford University.

The ironically fallacious prophecy of Sir William Crookes in 1898 that by 1931 the western world would be confronted by a serious deficit in the wheat supply failed to take account of the changed nature of demand resulting from modern working and living conditions as well as of increased efficiency in production. See J. S. Davis, "The Specter of the Dearth of Food: History's Answer to Sir William Crookes" in *Facts and Factors in Economic History* (Cambridge: Harvard University Press, 1932), pp. 733-754.

binders, the twine binder was invented by John F. Appleby in the late seventies. The next step in mechanization integrated the processes of harvesting and threshing by means of the time- and labor-saving combine, which was adjustable to different crops and scales of production.

Power was the unique mechanical contribution of this period. The practicability and availability of the gasoline tractor in all stages of cereal production was demonstrated both in the medium-scale enterprise of the humid areas and the vast undertakings of the Plains. Large-scale, mechanized agriculture reached its height in the 50,000-acre wheat farms of Montana, exceeding even the old bonanza ventures that had been dependent upon horse power.

The extension of wheat production into the Northwestern Plains area was directly related to the localization of the milling industry. The invention of the roller process to grind the hard durum varieties was a vital development for the producer of the grain as well as for the manufacturer of the flour.

Grazing Belt—The Range and the Ranch ³⁰

Large-scale wheat growing, as a more or less speculative enterprise, was extended into the semiarid region beyond the 98th meridian, in normal or dry-farming cultivation. Unfortunately, the planless and carelessly administered public-land system encouraged the extension of general family-unit farming into the danger zone with resulting periodic crop failures, varying mainly in the degree of disaster. But the general region came into line as a vast grazing belt—a cattle and sheep country.

Following the open range stage for a couple of decades after the War Between the States, the ranch became the typical form of enterprise. The ranching region furnished stock for the central markets and supplied feeders for the Corn Belt. Systematization of the modern meat-packing industry in Chicago, St. Louis, Kansas City, and Omaha in the seventies and eighties opened regular livestock markets.³¹

The effective utilization of the Plains, as well as of the open Prairies, for individual farming or stock raising was made possible by the introduction of barbed wire fencing. The invention of J. F. Glidden at De Kalb, Illinois, in 1874 provided a satisfactory product, and, after a long struggle over patent rights, the price was put within the reach of the average farmer. Meantime, breeds of beef and sheep were systematically improved. State and Federal control of animal diseases,

³⁰ The best general survey is E. E. Dale, *The Range Cattle Industry* (Norman, Okla.: University of Oklahoma Press, 1930). Special areas and phases are dealt with in E. S. Osgood, *The Day of the Cattleman* (Minneapolis: University of Minnesota Press, 1929), and Louis Pelzer, *The Cattlemen's Frontier* (Glendale, Cal.: Arthur H. Clark Company, 1936).

³¹ R. A. Clemen, *The American Livestock and Meat Industry* (New York: Ronald Press, 1923).

the regulation of shipping rates, and the formation of marketing associations gave a measure of stability to an industry that had been entered upon with little plan or system.

The Corn Belt ³²

Indian corn, or maize, because of its wide cultivation and basic position in crop systems and stock raising, remained the unchallenged monarch of American cereals. It was grown in all cultivable belts: in those of cotton, winter wheat, and dairying it had an essential place both as a feed and as a variant in crop rotation. Like wheat, corn moved westward, but, unlike the other cereal, its cultivation became localized in the strategically situated Prairie Plains. The crop's prevalence and dominance throughout the region was recognized in the designation of the belt. The Corn Belt, of somewhat variable bounds, in general coincided with the prairies. It stretched from western Ohio to southeastern South Dakota and southward along the Missouri River where it overlapped the belt of winter wheat. The region thus included most of Indiana, Illinois, and Iowa, southern Minnesota, eastern Kansas and Nebraska, and northern Missouri.

Its use as feed, rather than the cash sale of the bulk of the great crop, exercised an unusual stabilizing and conserving influence on the economy. In this garden spot of the nation hogs and cattle were fattened for the home and foreign trade. When grown in combinations with oats, clovers, and winter wheat, and when cultivated with reasonable care and by the best established methods, corn gave the fullest assurance of a dependable return.

With corn and hogs the main products of cultivation and husbandry, and with the current relations between the two the key to the financial return of a given season, special consideration was given to the nature and nurture of both. From the nineties selection and improvement of corn received increasing attention. For a long time the standard of the form of the ear—uniformity and symmetry—falsely guided the efforts of breeders and determined the ratings in corn shows and demonstrations. Perry G. Holden of the Iowa State College extension service became famous as a champion of these standards in his corn-demonstration trains, in regional short courses, and in farmers' mass meetings. These preliminary efforts at selection, along with increased attention to seed germination, helped to create an interest among farmers and prepare the way for the application of scientific corn breeding.³³

³² Two survey essays provide an excellent introduction to the study of this region: E. E. Edwards, "Middle Western Agricultural History as a Field of Research," *Mississippi Valley Historical Review*, Vol. XXIV (1937), pp. 315-328; L. B. Schmidt, "The Agricultural Revolution in the Prairies and the Great Plains of the United States," *Agricultural History*, Vol. VIII (1934), pp. 169-195.

³³ Paul de Kruif, *Hunger Fighters*, Book III; U. S. Department of Agriculture, *Yearbook, 1936*, pp. 462-490.

Dr. William J. Beal of the Michigan Agricultural College conducted sound but premature research in corn breeding as early as the seventies, but the effective basis of the modern hybrid strains, with their resistant and high yielding qualities, was laid in the first decade of the new century by George H. Shull at the Cold Springs Harbor Laboratory and by Edward M. East at the Connecticut experiment station. Henry A. Wallace of Iowa played a prominent role in the practical utilization of these findings. In addition to breeding, corn diseases and pests were among the leading concerns of the experiment stations in the Corn Belt.

No less care was bestowed on the lineage and development to marketable maturity of the hogs for which most of the corn was grown. From crosses of native and imported stock of the leading breeds, the most desirable combinations of qualities were secured. The change from the old heavy, lard type of hogs to the lighter, bacon animals in response to consumer desire marked a turning point in the industry. Whatever the breed or type, the traditional lowly hog had become an animal of increasing value, and consequently the epidemics of virulent diseases that attended the concentration of the industry were major calamities to the entire Corn-Hog Belt.

Hog cholera especially presented a mortal threat to the whole Corn Belt economy with a yearly loss reaching 144 per thousand in 1897. After long and patient experiment in a laboratory at Ames, Iowa, Dr. Marion Dorset, biochemist for the Federal Department of Agriculture, with the assistance of veterinary colleagues, developed a preventive serum that was given practical application in 1913. By the time the nation entered the First World War, the losses of the pork supply had been cut by more than half.³⁴

In general, progressive methods, early, varied, and wide adoption of machinery, prevalence of occupational organizations, and relatively high living standards were characteristic of the region in its maturity. Continuing fertility, in spite of serious erosion spots, the rising price level from the late nineties, and the limited extent of the true Prairies, along with speculative estimates of future trends, steadily raised the value of land. By the first decade of the new century, the high price of farm land was causing large numbers of prospective young farmers to migrate from the region to the American or Canadian Northwest or to the South.

A direct accompaniment of and, in considerable part, a result of the appreciated land values was a marked increase in tenancy. In the three leading Prairie states, the percentage of tenant holders increased from 26.3 in 1880 to 36.4 in 1910. Tenancy in the Corn Belt offered a marked contrast to that in the Cotton Belt. The high and mounting value of land made it increasingly difficult for a young farmer without adequate

³⁴ de Kruif, *Hunger Fighters*, Book II.

capital to buy and equip a farmstead. On the other hand, the success of the undertaking made possible relatively high cash rentals and enabled older farmers to rent their holdings, frequently to relatives, and to retire to an adjoining town or to the mild climate of southern California. There was in this generally favorable situation the obvious menace of an inflationary land boom, and a pressing credit need that limited and hampered the development and best utilization of the rising investment in a corn farm.

Among agricultural regions of the nation and of the world the Corn Belt seemed indeed a land of realized promise—a bucolic dream come true—whose peace and plenty was symbolized by “Ding’s”³⁵ famous cartoon of the prosperous and self-satisfied Iowa Farmer. In national councils, the region’s primacy in agricultural interests and leadership was recognized by the place accorded to its representatives in the newer agricultural organizations and by the continuous selection of the Federal secretary from one of these states.³⁶

The establishment of these main belts of production was an evidence and a condition of the change from pioneer venturing in production, marketing, and organization to reasoned specialization; from immediate necessities to more deliberate and permanent adjustments—in short from sectionalism to regionalism.³⁷ In its localization, as in its other trends, the revolution in agriculture was thus co-ordinate with that in manufacturing. Freed from the uncertainties and immaturities of pioneer days, with specialized production adjusted to regional conditions, both enterprises confronted the opportunities as well as the risks and complexities of the new order at home and abroad.

Agricultural Regions During the First World War³⁸

The period of relatively well-adjusted and balanced conditions in American agriculture from the recovery of the late nineties was brusquely interrupted by the outbreak of war in Europe. So far as agricultural production and marketing are concerned, the war period extended from the fall of 1914 to the spring of 1921; and comparisons may most helpfully be made with the preceding five-year average. During the first two years neutral trade did not stimulate agricultural production to any

³⁵ Jay N. Darling of the *New York Tribune-Herald* and the *Des Moines Register*.

³⁶ The only exception to date has been the temporary appointment (November 1924–March, 1925) of a West Virginian. The record of the states in number of incumbents follows: Iowa, 4; Missouri, 3; Indiana, Kansas, Nebraska, and Wisconsin, 1 each.

³⁷ On the meaning and development of regionalism, see Hedwig Hintze, “Regionalism,” *Encyclopedia of the Social Sciences*, Vol. XIII (New York: The Macmillan Company, 1934), pp. 208–218; H. W. Odum and H. E. Moore, *American Regionalism* (New York: Henry Holt & Company, 1933); F. J. Turner, *The Significance of Sections in American History* (New York: Henry Holt & Company, 1932).

³⁸ The most available discussion of the development of agriculture in this period is the U. S. Dept. of Agriculture, *Yearbook*, 1940, pp. 277–296.

marked degree. In fact, with the cessation of regular European trade certain commodities, notably cotton, were depressed. But with the large loans to Great Britain and France, followed by the entry of this nation into the conflict as the provisioner of the Allies, basic agricultural commodities were given unprecedented public stimulation. In the spirit of the popular slogan, "Food will win the war," the main effort of the Department of Agriculture was directed to increasing the production of cereals and meat.

The program was put into action largely through a new extension service created by the Smith-Lever Act of 1914 and implemented by the county-agent system with a co-operating farmers' organization, most frequently the Farm Bureau. Owing to the suddenness and the unprecedented magnitude of the demand along with the unusual need for certain products the undertaking "was inevitably an uneven, faulty expansion which threw out of gear no little of the favorable adjustment that had been achieved before the war."³⁹

With the emergency food requirements of the Allied armies and populations, and with the cutting off or sharp curtailment of ordinary sources of supply in Russia and South America, wheat came to be the cultivated product most urgently in demand. The production program thus centered on this enterprise, and the price was pegged at what seemed, in comparison with past levels, a most attractive return. As a result the wheat acreage was increased over 50 per cent and wheat production 38 per cent. The bulk of this increase was in winter wheat, and the added acreage was provided at the expense of other small grains, corn, and grasslands. Over one-quarter of the new wheat lands was located in the Corn Belt and most of the remainder in the pasturage and forest areas of the Great Plains. In livestock industries the demand for fats gave the greatest boom to hog production. In comparison with the pre-war 5-year average of 450,000,000 pounds in exports of pork and lard, over 1,000,000,000 pounds were shipped abroad in 1918.

The remarkable increase in the export of concentrated milks, together with the larger domestic consumption of milk and its products resulting from the increased purchasing power of workers, added more than 1,500,000 head to the country's dairy cows and led to a general expansion of the dairying enterprise. Even on the basis of war demand such expansion was often unsound; for in general dairy prices were unfavorable in comparison with the cost of feed. Much the same condition prevailed in the poultry business where increased war demand was met at an unfavorable ratio of costs of production.

Following an overextension and overproduction of the cotton crop in 1914, exports were reduced during the war period by about one-fourth.

³⁹ U. S. Dept. of Agriculture, *Yearbook*, 1940, p. 292.

In spite of this reduction, general business stimulation, increased industrial demand, and inflation brought a record crop in 1919 valued at \$2,000,000,000. Tobacco acreage expanded gradually and the price rose threefold, mainly by reason of the increased demand of soldiers and civilians for cigarettes; the period marked the beginning of the present-day spectacular consumption of this product.

The conclusion reached by the most reliable statistical studies is that the farmers' return in the war years was by no means excessive. The three years, 1917-1919, were the only ones of the period that could be characterized as relatively good, and returns varied greatly for different enterprises. Thus, while prices of wheat, tobacco, and hogs were relatively high, those of horses, cattle, butter, and eggs ranged relatively low. Inflated values were largely responsible for the general high level of prices and this influence increased markedly, and at times disproportionately, the farmers' production and living costs. A special element in mounting costs for the new or extending proprietor was that of land values, which for the country as a whole went up as much as 70 per cent from 1913 to 1920. This rise was most spectacular in the Corn Belt. Meantime, intensified and extended mechanization added to capital charges.

For agriculture two of the most positive results of the war were thus the greatly multiplied rent, interest, and tax charges, and the expansion and in certain cases the derangement of production belts, as illustrated most strikingly by the extension of wheat growing in the Corn Belt and the Great Plains. Both of these developments endangered regional balance and security.

Post-War Deflation and Depression ⁴⁰

The price decline that set off the primary depression in 1920 came first and fell farthest in agricultural products. When credits were withdrawn the foreign markets collapsed, while the production equipment to supply it retained its high costs of maintenance. Added acreage, mechanization, and improved methods created a surplus for which there was no outlet at a remunerative price. With his large proportion of fixed costs, the farmer sought to better his position by increased production at a low price rather than to raise the price by curtailment of his output.

The recovery of business in the middle twenties and the resulting industrial and financial boom brought to agriculture an improvement that was limited and spotty. At the peak of the boom in 1929 the index of agricultural prices was only 91 per cent of the pre-war level. With the Great Depression the ratio fell to 50 by February, 1933. Gross farm

⁴⁰ See U. S. Dept. of Agriculture, *Yearbook*, 1940, pp. 297-326, for the course of agriculture between the wars.

income, which had risen from \$7,000,000,000 in 1914 to \$17,000,000,000 in 1919, fell to the low of slightly over \$5,000,000,000 in 1932.

Regional responses to distress

The distress came at different periods and with varying degrees of intensity in the different regions. From 1920 to 1922 hard times and their resulting protest centered in the spring wheat region. By 1923 the slump of the hog market brought widespread bank failures and farm foreclosures in the Corn Belt; hence this region was accorded first place in relief proposals. Southern interests that had sought relief for specific commodities individually in the early years of the depression were ready for a more general program by 1926. By 1932-1933 all regions and all farm commodities were directly involved in the general and complete collapse.

Relief efforts, 1921-1933 ⁴¹

Owing to the traditional and still prevalent attitude toward the relation of Government to economic problems, the early efforts at relief were made by commodity co-operatives aimed at restoring a profitable return by controlling output. Successive administrations from 1921 to 1933 placed main reliance upon co-operative action, with Governmental policy strictly incidental or supplementary. The main relief act—the establishment of the Farm Board in 1929—was drawn up chiefly to support and promote co-operative marketing associations. The limitations and inadequacies of these highly desirable agencies were soon manifested. Group consciousness and loyalty were not strong enough to insure united action; general problems vital to the entire agricultural occupation necessitated public provision and direction. Recognizing the urgent needs and, more or less adequately, the opportunities of the situation, the leading general agricultural organizations, the Grange, the Farmers' Union, and the American Farm Bureau Federation (formed in 1921) initiated programs of national relief.

In 1921 the Farm Bureau backed an "Agricultural Bloc" ⁴² of Western and Southern Senators and Representatives in sponsoring and propagating emergency and long-time measures of relief and stabilization. The central objectives of such legislation were the disposal of farm surpluses and provision for credit.

With the renewal and elevation of protective tariff rates for industry, in spite of the change of the nation from a debtor to creditor status,

⁴¹ Of the numerous analytical books on farm relief in this period, probably the most serious and scholarly are J. D. Black, *Agricultural Reform in the United States* (New York: McGraw-Hill Book Company, 1929), and E. R. A. Seligman, *Economics of Farm Relief* (New York: Columbia University Press, 1929).

⁴² A contemporary account by a leading participant is Arthur Capper, *The Agricultural Bloc* (New York: Harcourt, Brace and Company, 1922).

there was a persistent agitation to utilize this venerable protective and promotive device to establish and maintain a cost-of-production price for the leading farm products in the home market. The most publicized of such proposals was the McNary-Haugen plan to dispose of the surplus (above domestic demands) abroad, the costs to be borne by an equalization fee assessed on the producers. Twice passed by both houses of Congress, the bill was in each case vetoed by President Coolidge.

Credit needs were recognized in this period by the provision in 1923 of intermediate credit banks to make short-term loans on livestock and farm commodities. Next to the Farm Board Act, this was perhaps the most important agricultural measure of the decade. The dozen years of continuous agitation for farm relief before 1933 focused attention on the problem as a major national issue, stimulated the search for remedies, and put into operation preliminary tests of policies; in this way the period before 1933 helped to prepare the way for the more complete and elaborate program which followed.

Agriculture in the New Deal

Like other parts of the New Deal program, the agricultural policies, owing to emergency demands, the findings of trial and error, the pressure of interest groups, and adjustments necessitated by judicial interpretation, went through a series of stages and were subjected to important modifications in emphasis and methods.

To offset the emergency of price collapse in 1933 extreme measures were included in the first Agricultural Adjustment Act to reduce production drastically and to provide for compensation payments secured by a tax upon processors and a devaluation of the currency. After a year of trial the reduction program was upset by a series of droughts culminating in 1935-1936 in the dust storms of the Southern Plains. The problem of surplus was changed to one of shortage. At this point, in 1936, the Supreme Court held the A. A. Act unconstitutional as an unwarranted invasion of state jurisdiction and an improper use of the taxing power.

The policy now shifted to an emphasis upon bettered production and the provision for an "ever-normal granary." The new Agricultural Adjustment Act of 1938 was a synthesis and a cumulation of proposals dealing with the basic problems of the producers of the main agricultural commodities: it comprised legislative machinery for soil conservation and balanced output, loans, marketing quotas, parity payments, marketing aid and promotion, and crop insurance for the precarious wheat-growing enterprise. Special acts dealt with the problems of tenancy, credit, and rural social security.

Regional differences presented the most difficult and complex problems of adjustment and security. Wheat, corn and hogs, cotton, and other leading enterprises had their special needs and interests. What-

ever its limitations and questionable features, the program as completed by 1939 marked, in its inclusiveness of policy and elaborateness of organization, a real farmers' charter.

But before the full program could have adequate trial, agriculture, like the other branches of national economy, was involved fully in a war global in extent and magnitude. Again production demands, under pressure of military requirements and the lend-lease program, were to be extended and speeded to potential capacity.

Whether the present generation profits by the experiences of past wars depends upon the moderation and foresight with which the basic problems are dealt. Will deflation be kept within controllable bounds? Will an immoderate land boom be avoided? Will disorganization of belts of production and undue extension of the margin of cultivation be restrained? Will reciprocal trade agreements be continued and extended? Upon such decisions rest both the immediate and the future position of the agricultural occupation and the well-being and progress of the agricultural population.

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CHAPTER 19

The Great Plains

AS A GEOGRAPHIC PROVINCE, the Great Plains are entirely unlike any other region of the United States. They comprise a vast, treeless, and semiarid area embracing about two-thirds of the Louisiana Territory acquired by the United States from France in 1803. Meriwether Lewis and William Clark led an expedition across their upper part *via* the Missouri River in 1804-1806, and Z. M. Pike and his explorers crossed their lower part in 1806-1807. Pike regarded the plains he crossed as a desert, too arid for the occupation of white men; and Major Stephen H. Long, who led an exploring party across much the same region in 1820, concurred in Pike's opinion. Indeed, Long wrote "Great American Desert" across the Great Plains part of a map accompanying his report of the expedition, and American geographers in later years so described them in the nation's textbooks.

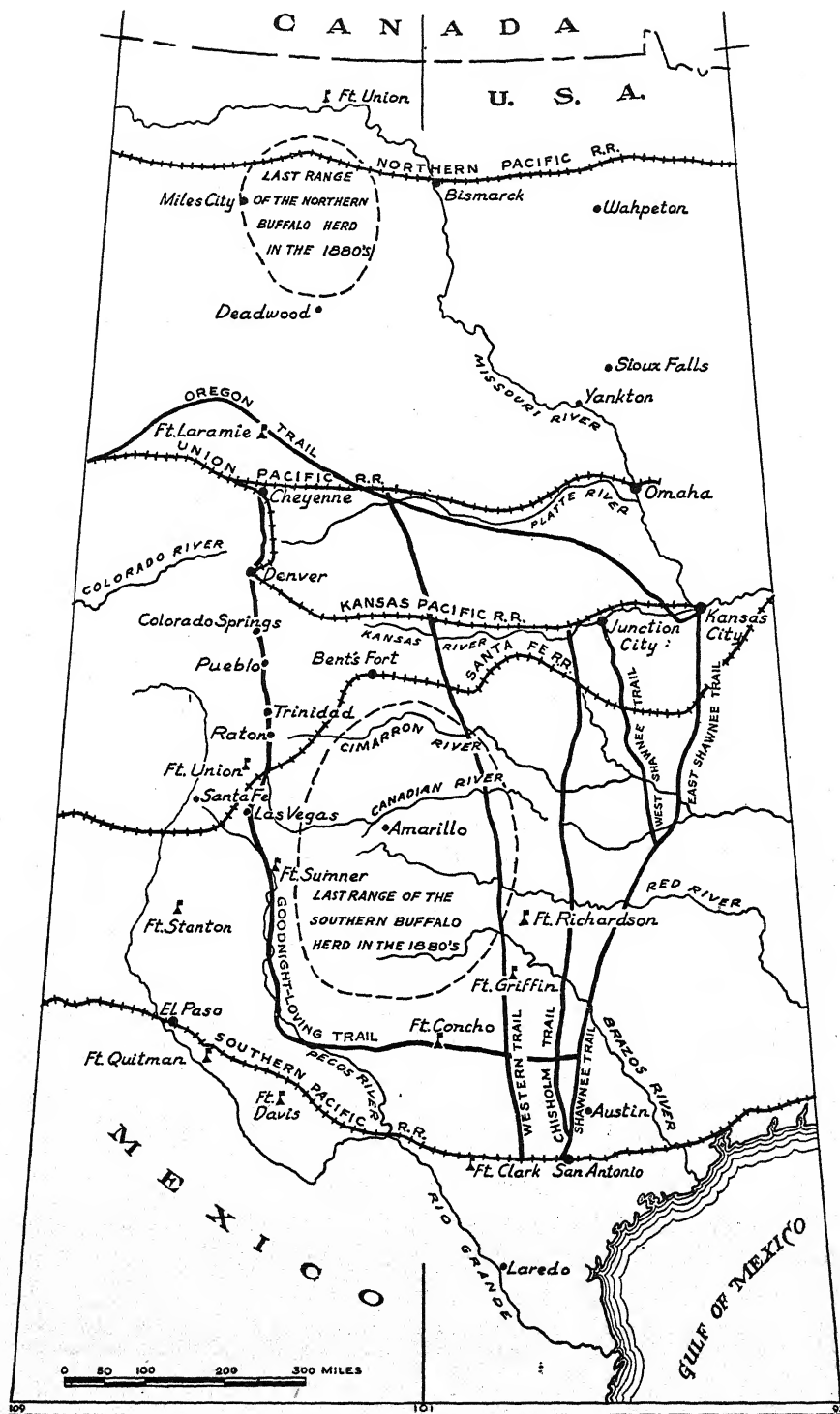
The Great Plains range in elevation from 1,000 feet along their eastern border to 6,000 feet at the base of the Rocky Mountains. During early days, their wide-sweeping surface was generally grass-carpeted and of fine soil. East of the Mississippi River, settlers had found adequate supplies of wood and water, in addition to good land. But on the Great Plains there was neither, except in restricted areas, and as a consequence homesteaders resorted to unique adaptations.¹ Such innovations, combined with many others, gradually transformed the immigrants into plainsmen, as will be noticed further along in this chapter.

The Great Plains were visited by adventurers and hunters from many nations during the first two decades after they became a possession of the United States. Their broad bosom was ranged by countless herds of antelope, bison, and elk, as well as by Indians, all of which attracted many restless spirits. Others came seeking economic opportunity.

Sante Fe Traders

Coronado crossed the Southern Plains in 1541 and within the next two centuries other Spaniards became fairly familiar with the same area,

¹ The most authoritative book on the Great Plains is W. P. Webb, *The Great Plains* (Boston: Ginn and Company, 1931). As to a division of the region into two geographic provinces, see Willard D. Johnson, "The High Plains and their Utilization," in twenty-first and twenty-second Annual Reports of the United States Geologic Survey, parts IV (Washington, 1901-1902).



THE PASSING OF THE GREAT PLAINS FRONTIER

although they did little to exploit their prior claim. French explorers did not venture beyond the Mississippi Valley until several decades after La Salle's exploration of the lower Mississippi River in 1682. In 1719, however, Du Tisne journeyed westward from the Missouri River, probably as far as the Pawnee country of central Kansas. Four years later Bourmond established Fort Orleans in present Carroll County, Missouri; and from there he projected trading expeditions to the Kansas Indians, offering guns, sabers, axes, knives, combs, awls, kettles, bells, beads, cloth, rings, and vermilion in exchange for furs and buffalo robes. This contact was to have far-reaching consequences, for from the same general area other Frenchmen finally pushed on southwestward to Santa Fe, thus opening the Santa Fe Trail and trade. In 1739 Peter and Paul Mallet led a party of six traders from Illinois to Santa Fe, probably approaching New Mexico by crossing Nebraska, Kansas, and Colorado, or approximating the same route traveled later by Anglo-Americans. And for the next decade a lively trade was carried on between French and Spanish outpost settlements. In 1749 Pierre Satren led a successful expedition to Santa Fe over the Arkansas River route, and two years later he was followed by Jean Chapuis with an even larger party of traders. Chapuis envisaged the development of a great two-way commerce and suggested to New Mexican officials that it be protected by joint military escorts. But the doubtful Spaniards turned down his suggestion, confiscated his goods, and threw him into prison.

This setback did not end trader intrusions. By the beginning of the nineteenth century Anglo-Americans had also appeared in Santa Fe. Although he did not go as far west as Santa Fe, Philip Nolan, in 1801, probably backed by President Thomas Jefferson, led a party of about 34 armed Americans and six or seven Creoles into the central Texas prairie country near the Trinity River where he was killed, his entire party being either slain or captured by Spanish troops.

So far as is known, William Morrison, a prominent merchant of Kaskaskia, Illinois, was the first Anglo-American interested in New Mexican trade. In 1804 he provided Jean Baptiste Lalande with a large supply of trade goods to sell in Santa Fe. But Lalande chose to remain in New Mexico's salubrious climate after he had disposed of his wares, and a two-way trade between the frontiers was to await the passing of more than a decade and a half. During this period Captain McCallan, Reuben Smith, James Patterson, Jacob Fowler, A. P. Chouteau, and Julius de Munn sought without encouraging results to trade with the New Mexicans. Spain still maintained her centuries-old exclusion policy.

The Mexican Revolution of 1821 worked a marked change in Western trade. In the spring of that year William Becknell of Boone's Lick, Missouri, conducted a pack train *via* Taos to Santa Fe, where he sold

his calicoes at Vera Cruz prices (\$2 and \$3 per *vara*). A few weeks later he was back in Missouri with the electrifying news that traders were now welcome in New Mexico. Within the next year, as leader of a train of three wagons and pack animals, he attempted to travel a shortcut to Santa Fe *via* the Cimarron "desert" and was forced to retrace his steps to Missouri, almost perishing from thirst. But in later years other traders succeeded where Becknell had failed. Also in 1822 Benjamin Cooper, with his nephew Braxton Cooper, journeyed to Santa Fe with a pack train. He, too, met with success and returned the following year to reap additional profit. In 1824 a caravan of 83 men, headed by Colonel Marmaduke, Bernard Pratte, and Augustus Storrs, with 24 wagons and carts, a small cannon, and 200 horses passed over the trail. At Santa Fe, the traders exchanged their goods for \$180,000 in gold and silver and for furs valued at \$10,000.

Missouri now prepared to take advantage of the prairie commerce, and Senator Thomas Hart Benton of this state prevailed upon Congress to appropriate \$30,000 to sponsor it. Ten thousand dollars of this amount was intended for surveying and marking the trail, and \$20,000 for purchasing the right of transit from the prairie Indians. But in neither endeavor were Federal officials entirely successful. Commissioners built earthen mounds along the usual route as far as the Arkansas, then followed the river to the base of the Rockies and thence down to the upper waters of the Canadian. Nevertheless, many traders continued to use the Cimarron cutoff, which intersected the Government road at the Canadian. The trail from this point ran southward for a short distance; then a branch trail turned westward to Taos. The main trail continued on *via* Las Vegas to Santa Fe. The prairie Indians accepted the white man's cash but they continued to molest the caravans.

Franklin, Missouri, was the first eastern terminus of the trail. Then, when Franklin was destroyed by a Missouri River flood, Independence was favored. Finally, after a considerable river trade had sprung up between St. Louis and Westport, the latter town became the starting point. But whether traders started from the one town or the other, their caravans were not organized until they arrived at Council Grove. There they elected a captain, a guide, and other necessary officers, and promulgated caravan regulations. This practice was essential if they were to guard against the attacks of marauding Indians who lurked along the trail.

The traders brought to Santa Fe a wide variety of offerings: cotton goods such as coarse and fine cambrics, calicoes, domestics, shawls, handkerchiefs, steam-loom shirtings, and cotton hose. There were also woolen goods, consisting of super blues, stroudings, pelisse cloths; shawls, crapes, bombazettes; and some light articles of cutlery and looking glasses. They brought back to Missouri specie, livestock, furs,

wool, Mexican blankets, beaver skins, and buffalo robes. Until 1843 the Santa Fe Trail became increasingly important as an artery of commerce. Josiah Gregg, who was active in the trade during this earlier period, listed 3,160 men, 983 wagons, and merchandise valued at \$3,022,000 as representing the total traffic over the trail during his day. President Santa Anna of Mexico stopped the trade during 1843 and 1844, but it was resumed in the next year and was valued at \$1,702,250 by 1846. Mexican traders who went to St. Louis in this year placed the annual trade as high as \$2,000,000. In their own wagons were goods worth \$350,000. Brigadier General Stephen Watt Kearny led an expedition into New Mexico at the beginning of the Mexican War, and a large trader caravan accompanied him. After the war, the trade continued to be lively.²

When the trade grew, Mexican revenue officials at Santa Fe levied a high tax on it, but in one way or another this tax was evaded or the officials were bribed. Later an arbitrary tax of \$500 was imposed on each wagon, but Yankee ingenuity was equal to the occasion. The traders either built larger wagons to accommodate a larger quantity of goods, or they stopped before reaching Santa Fe and transferred the loads of two or three wagons onto one before driving into town. Others refused to pay the exorbitant tax and traveled on south to Chihuahua.

Missouri profited more than other Western states from the Santa Fe trade. Hundreds of its citizens engaged in raising mules to supply the urgent demand for teams to pull the cumbrous Murphy wagons used by the traders, and hundreds of others were employed as traders, masters, drivers, and scouts. There was also another factor to be noticed, but one not beneficial to the state. Many enterprising merchants and traders moved to New Mexico and became its first Anglo-American citizens, thus laying the basis for a new composite culture.

The Oregon and Mormon trails were also large arteries of commerce across the Great Plains, but they benefited the Great Basin and the Pacific Northwest more than they did the Plains. The first considerable emigrant caravan, including more than 100 men, women, and children, started from Independence, Missouri, to Oregon in the spring of 1842; and in the next year 1,000 emigrants assembled at the same point for the journey. From this time until well after Oregon was made a state of the American Union, the Oregon Trail was a well-known route to the Pacific Northwest. The Mormon Trail was even more important as a connecting link between the Missouri River and the Great Basin, and,

² In Reuben Gold Thwaites, *Early Western Travels, 1743-1846* (Cleveland: Arthur H. Clark Company, 1904-1907) are found the narratives of such Santa Fe traders and visitors as Josiah Gregg, Jacob Fowler, and T. J. Farnham (see index). For later accounts consult R. L. Duffus, *The Santa Fe Trail* (New York: Tudor Publishing Company, 1934); Colonel Henry Inman, *The Old Santa Fe Trail: The Story of a Great Highway* (New York: The Macmillan Company, 1898).

when gold was discovered in California in 1848, thousands of gold-seekers traveled over it, *via* Salt Lake City. It is estimated that in the year 1849 nearly 35,000 emigrants crossed the Great Plains for California. The Oregon Trail extended from Council Bluffs on the Missouri along the south bank of the North Platte to South Pass, and then on to Oregon *via* Fort Hall and Fort Boise. The Mormon Trail, along the north bank of the North Platte River, paralleled the Oregon Trail as far as the head of the North Platte and then extended through South Pass to Salt Lake City.

The Fur Traders

From the time that Mississippi Valley traders had first pushed up the Red, the Arkansas, and the Missouri Rivers to the Rolling Plains (the eastern part of the Great Plains), New Orleans and St. Louis had been well-known outfitting points. In fact, much of the growth of these two towns during the first half of the nineteenth century was brought about by Great Plains trade. Traders moving out from these supply centers were not content to wander about among the Indians, but persuaded them to trade at posts established at convenient points. Fort Laramie on the North Platte River in Wyoming, Fort Bridger, guarding the gateway between the plains and the Great Basin of Utah, Fort Bent on the Arkansas, Torrey's Trading House on the Brazos River of Texas, and Warren's, Coffey's, and Chouteau's trading houses in Indian Territory were such merchandising centers. At these places the traders reaped golden harvests at the expense of the red men, who were eager to procure whiskey, guns, powder, lead, paint, and calico.

Although fur traders generally operated within the Western mountains, they also exploited every opportunity on the Great Plains. In 1807 a party of St. Louis traders was active in western Montana, while another led by Manuel Lisa and Pierre Chouteau established Fort Manuel at the mouth of the Big Horn and traded with the Indians of that vicinity. In the following summer St. Louis businessmen interested in the fur trade organized the St. Louis Missouri Fur Company with such men as Lisa, Chouteau, William Clark, and Reuben Lewis as its guiding spirits; and in June, 1809, they began trading in the Big Horn country. But they were driven out by the Blackfeet Indians, who were probably encouraged in their hostility by the Canadian traders. Lisa sent traders from Fort Manuel to the Upper Arkansas, where for months they engaged in profitable trade and trapping. Other traders—Nathaniel Pryor, Hugh Glenn, and the Chouteaus—were active farther south.

Some of the traders even experimented in farming. A. P. Chouteau, in 1831, had a large farm in Indian Territory upon which he raised more food than was necessary for himself, his family, and his followers.

And John C. Fremont in the 1840's found that Lupton's Trading Post near the base of the Rocky Mountains in eastern Colorado was beginning to assume the appearance of a comfortable farm. Horses, cattle, and hogs ranged about on the prairies; there were different kinds of poultry; and there was the wreck of a promising garden, in which a considerable variety of vegetables had once flourished.³

Destruction of the American Bison

Still another pioneer trading industry was of great importance on the Great Plains. During the period 1820-1880, red and white hunters sought out bison herds, since both the hides and meat were media of exchange. During the eighteenth century the range of the bison extended east of the Mississippi River and west of the Rocky Mountains, but by 1850 it was largely restricted to the Great Plains. Here grazed about 15,000,000 bison, divided into two great herds—a Northern and a Southern herd. In 1849 Captain Howard Stansbury, while traveling over the North Platte Trail, made mention of the division of the herd, stating that his hunters could hardly supply his command with meat unless they traveled great distances on either side of the road. Three years later, while he was moving over the Santa Fe Trail, Colonel Alexander Doniphan found the Southern herd in southwestern Kansas. His chief hunter, Thomas Forsythe, standing on top of Pawnee Rock, calculated the number of bison he could see at 300,000, and others with him estimated them at 200,000 to 800,000. But in no direction could they see the outer edge of the herd.

The destruction of the two great herds by the early 1880's had two important results. First, as long as the Indians could depend on the bison for food and clothing, they resisted the Federal program of reservation and subsistence. But when the herds were destroyed, they were more amenable to Federal control.

The second result was the enormous trade in "flint" hides and bones carried on by early Great Plains settlers. In 1845 Fremont submitted figures of the American Fur Company to show that Upper Missouri Indians alone had sold annually (over a period of a decade) 90,000 robes to white traders. Since buffalo hides were taken for robes only four months in the year, it may be safely estimated that the annual slaughter of bison by the Indians approximated 120,000. Another contemporary observer computed the destruction of Great Plains bison during 1835-1845 at 400,000 annually, or a total of 5,000,000. This figure could hardly represent the maximum. Tanning tests during the early 1870's by American and English tanneries revealed that buffalo

³ The only comprehensive study of the fur trade available is Hiram Chittenden, *The American Fur Trade in the Far West*. Reprinted, 2 vols. New York: Press of the Pioneers, 1935.

hides could be used to good advantage in shoe and harness manufacture; within the next few years hundreds of hunters, in parties large and small, moved into the buffalo country to supply the new market.

The selling price of buffalo hides, from \$1 to \$3 each, afforded a rare opportunity to hunters. It was not uncommon for a party of six men to kill and skin 50 or more bison in a day. By 1875 hundreds of hunters with long-range rifles followed the herds from watering place to grazing ground, slaying thousands. In 1877 a Texas Representative reported to Congress that more than 500 hunters had pitched their camps on the prairies between the Red and Brazos rivers. On January 7 of that year the F. E. Conrad general merchandise store at Fort Griffin, Texas, sold goods valued at more than \$4,000, of which \$2,500 represented guns and ammunition sold to hunters. Also within that year, 50 miles farther west, at Reynold's City (a hide-buying town built of sod) \$1,000,000 was paid for hides, and several other similar stations were distributed over the Southern Plains. Within the two years, 1872 to 1874, 1,378,359 hides, 6,751,200 pounds of meat, and 32,380,850 pounds of bones were shipped to Eastern markets over the Santa Fe, the Union Pacific, and the Kansas Pacific railroads, and large caravans were moving to the nearest markets from the Northern Plains. General Nelson A. Miles, who saw much of the slaughter during these years, stated later that 4,373,730 bison were slain during the early 1870's, while another observer placed the number at a million more. At best, available data are incomplete. Conservative figures, however, indicate that during the 15-year period, 1870-1885, 10,000,000 bison were killed. An approximate estimate of the value of their hides would run to about \$25,000,000.⁴

During the early years of the "grand kill" Texas legislators were much concerned, and talked of hunting restrictions, but Lieutenant General P. H. Sheridan dissuaded them, telling them that only in this way could the Indians be tamed and the plains made free for "speckled cattle." By 1880 the last of the bison of the Southern herd was slain and three years later Sitting Bull and his Sioux warriors had destroyed the remnants of the Northern herd. With their "wild commissary" gone, the nomadic Indians accepted reservation life and Government subsistence, and ranchers moved their herds onto the grassy High Plains. Cattlemen could now furnish the market with a meat of finer texture and quality.

The Range Cattle Industry

The Texas range cattle were of Spanish origin. By 1865 thousands of descendants of this breed were found in the brush country of the

⁴ Douglas Branch, *The Hunting of the Buffalo*. New York: D. Appleton-Century Company, 1929. John R. Cook, *The Border and the Buffalo*. Topeka: Crane and Company, 1907.

Rio Grande Valley and the prairies and Cross Timbers of western Texas. Although these "mavericks" were ungainly, gaunt, and wild, they could be used as beef cattle. On the prairies they were worth only \$6 or \$7 per head; but in a Kansas or Missouri market, it was not uncommon for a two-year-old steer to sell for \$40 or more. Thus, the Texas cowman's chief problem was to get his cattle to a market, a feat not easily accomplished. There were no north-and-south railroads over which he could ship his cattle, and transportation *via* the Gulf and Mississippi entailed long delays and prohibitive expense. But a way was soon found. In the summer of 1865 a rancher drove a herd through eastern Indian Territory to a Missouri market and sold at high prices. In the next year cowmen drove large herds over the East Shawnee Trail to Baxter Springs, Kansas, or on northward to Kansas City; from southern Indian Territory, they diverted them northwesterly over the West Shawnee Trail to Junction City, Kansas, on the Kansas Pacific Railroad. The appearance of tick fever, however, had alarmed Kansas farmers and caused them in 1866 to close these two trails to Texas cattlemen.

In 1867 Joseph G. McCoy, an Illinois cattle dealer, opened a new market at the terminus town of Abilene on the Kansas Pacific, west of the frontier farm settlements. Texas cattle now crowded the stock pens of Abilene and such other towns en route as Wichita, Ellsworth, Newton, and Caldwell. Cattle driven to Kansas markets numbered 75,000 in 1868; 350,000 in 1869; and more than 600,000 in 1871. Meanwhile the vanguard of farm settlements was thrust athwart the Abilene Trail (or Chisholm Trail) and a new route from Texas to Kansas was projected still farther west, known as the Western Trail, running *via* Doan's Store on the Red River and Camp Supply to Dodge City. Stockmen in western Texas drove their herds over the Goodnight-Loving Trail from Fort Concho westward to Horsehead Crossing of the Pecos, and then up into New Mexico through the Pecos Valley. Many herds were driven over this route still farther northward to Colorado and Wyoming ranges. Of more than 100,000 cattle passing over the Goodnight-Loving Trail in 1870, Montana received 20,000; Wyoming, 8,000; Idaho, 11,000; Nevada, 7,000; Utah, 8,000; and California, 10,000. The remaining 36,000 or more were sold in New Mexico.

Within a few years the cattle industry had invaded all parts of the Great Plains. The far-spreading bluestem, grama, and mesquite grasslands were ideally suited for ranching and yearly expenses were nominal. Not uncommonly the rancher was a tenant-at-will, squatting on the public domain, or he leased his land at a nominal rental. In either case he built a sod house or dugout near a running stream, with appurtenant corrals and sheds, hired a cowboy to take care of his small herd, and bought a supply of groceries. At the end of the year he was able to

sell enough cattle to meet all his expenses and to have a small sum left to purchase more cattle. These cattle, supplemented by the annual crop of calves, plus the remainder of the original herd, rapidly increased the income of the rancher. News of such successes spread quickly to other parts of the nation, and even to Europe, and by 1885 many investors appeared in the Great Plains to acquire ranch holdings.

By 1875 ranches checkerboarded the Texas frontier to the depth of more than 100 miles, and two years later the Northwestern Texas Cattle Raiser's Association was organized to provide for roundups, to guard against cattle stealing, and to enact needful regulations governing their interests. As the ranching industry spread northward and westward, other similar organizations were set up, such as the Cherokee Strip Live Stock Association, the Colorado Cattle Raiser's Association, and the Wyoming Stock Raiser's Association.

Great Plains real estate promoters made much of this pioneer industry, advertising far and wide its advantages, with satisfactory results. Hundreds of eager immigrants invested in the industry; some with ample means, others with hardly enough for a year's subsistence. By 1880 range-fed beef of the Great Plains even threatened the English market, and a Parliamentary committee was sent to America to investigate conditions that made it possible for the Great Plains cattlemen to undersell the English. Later, the committee reported that the maintenance cost of American ranching was negligible, and that it was not uncommon for the American rancher to make as much as 30 per cent profit within a year. English and Scottish investors now banded together to exploit this new opportunity, and Edinburgh, Scotland, became an important investment center. In 1882 the Wyoming Stock Raiser's Association estimated that foreign investments, largely in Texas and Wyoming, amounted to \$30,000,000. Two years later Representative N. W. Nutting of New York reported to Congress that foreign investors controlled more than 20,000,000 acres of Great Plains ranch lands and threatened to absorb the entire Western ranch industry.

Titled Europeans, along with avaricious investors, were attracted to this colorful industry. The Marquis de Mores, a Frenchman, built the town of Medora on the Union Pacific Railroad in western Dakota and bought up large contiguous ranch properties. Farther south, in Colorado, Baron von Richthofen, a German, also engaged in ranching, with the Earl of Dunraven, an Englishman in Estes Park, as his neighbor. Although not a nobleman, John George Adair, who owned a large estate at Rathdairs, Ireland, bought from Colonel Charles Goodnight part interest in the JA Ranch of the Palo Duro Canyon, near present Amarillo, Texas. The Scottish American Mortgage Company controlled three large properties: the Arkansas Ranch, extending from the Arkansas River in Colorado on the north to the Colorado-New Mexico line on the

south, comprising 2,240,000 acres; the Cimarron Ranch, in northern New Mexico, extending 24 miles from the Colorado line to the south line of Mora County, an area of 2,580,000 acres; and the Canadian Ranch in Potter and Oldham counties of Texas, 256,000 acres. More than 140,000 cattle grazed these three properties. Other English and Scottish investments were in the Espuela (Spur) Land and Cattle Company of western Texas, the Wyoming Ranches Limited, the Western Land and Cattle Company with interests in California, Montana, and Wyoming, and the Swan Land and Cattle Company of Wyoming.⁵

Early American properties were indicative of individual enterprise. In 1870, the King ranch on the Santa Gertrudes River in southern Texas contained 84,032 acres and supported 65,000 cattle, in addition to thousands of horses, sheep, and goats; Mifflin Kennedy's Robideaux Ranch, on a peninsula of the Gulf of Mexico, embraced 142,840 acres and grazed 30,000 cattle. But American investors were also represented in large stock companies. A Chicago syndicate contracted to build the Texas capitol at Austin in exchange for 3,050,000 acres of land in nine Texas Panhandle counties. This huge property, known as the XIT Ranch, required a three-strand wire fence of 781 $\frac{1}{4}$ miles to enclose it. It ranged more than 150,000 cattle.

Like other mushroom enterprises, the range cattle industry came on evil days. By 1885 the range was overstocked and the market was glutted with Great Plains beef. Interest rates on borrowed money were high and many a rancher had borrowed recklessly in order to share in what seemed to him a golden harvest. Then came the crash. The protracted drought and severe winter of 1886-1887 brought the loss of hundreds of thousands of cattle. Bondholders and moneylenders took over many Western ranches and sought to operate them on a more conservative basis. Ranchers who could see the end of the free range days bought up valuable properties, fenced them, and imported Shorthorns, Polled Angus, Herefords, and other improved breeds of cattle. By the close of the 1880's the new era of ranching had been launched. Many cattlemen broke their ranches up into 160-acre tracts and sold them to farmers, or turned their attention to sheep raising.

Advent of the Farmer

Free-range cattlemen could not withstand the westward advance of farmers seeking homes under the Federal Homestead Law of 1862.

⁵ For economic aspects of the range cattle industry see E. E. Dale, *The Range Cattle Industry* (Norman: University of Oklahoma Press, 1930). The ever-expanding area devoted to cattle grazing is best presented in Louis Pelzer, *The Cattleman's Frontier* (Glendale: Arthur H. Clark Company, 1936). Other studies of merit are E. S. Osgood, *The Day of the Cattleman* (Minneapolis: University of Minnesota, 1929); and Joseph G. McCoy, *Historic Sketches of the Cattle Trade of the West and Southwest* (Kansas City: J. T. Reton and Company, 1874).

Within the humid belt east of the Mississippi River experience had shown that the amount of land the homesteader could improve and cultivate well was relatively small. The thick growth of timber, underbrush, weeds, and grass required constant toil if the settler were to realize the greatest return from his land. This fundamental truth presently found expression in Congressional land laws. The Ordinance of 1785 had provided 640 acres as the smallest unit of land for sale at the price of \$1.00 per acre. But there were few home-seekers who could either buy or improve such an extensive area. When this was made clear to our national lawmakers, the unit of sale was gradually reduced. The land law of 1800 reduced the homestead unit to 320 acres; that of 1804 to 160 acres; of 1820 to 80 acres; and of 1832 to 40 acres.

Moreover, a part-answer was given to the homesteader's demand for a liberal land policy when Congress enacted a series of pre-emption laws culminating in the law of 1841 sponsored by Senator Thomas Hart Benton and signed by President John Tyler. This law permitted a claimant to acquire as much as 160 acres of the public domain at the Government's minimum price of \$1.25 an acre and gave him one year in which to pay for it. Much of the trans-Mississippi prairie country was acquired by settlers under its terms.

But the Homestead Act of 1862 furnished a greater incentive to the farmer. It provided that any person who was the head of a family, or who had arrived at the age of 21 years, and was a citizen of the United States, or who had filed his declaration of intention to become such, and who had never borne arms against the United States Government or given aid and comfort to its enemies, was entitled to 160 acres of Government land in an area other than a railroad grant, where only 80 acres could be had. A fee of \$18 was charged for each homestead.* Certain improvements had to be made, such as building a house, digging a well, and putting a part of the land in cultivation. The first homestead claimed under the law, according to Professor Everett Dick, was by Daniel Freeman, a veteran of the War Between the States, near Beatrice, Nebraska, on January 1, 1863.⁶ Then followed a general rush for choice claims in Kansas and Nebraska. Texas had retained its own public lands when it entered the Union and was not subject to the operations of the Federal land law. Yet its lands were sold at low prices.

On the Great Plains the small land-unit concept of incoming settlers was finally modified. The Homestead Law of 1862 had provided only 160 acres for each homesteader but in the semiarid West this was hardly

⁶ *The Sod House Frontier*, p. 119. New York: D. Appleton-Century Company, 1937.

* Actually, the amount of this fee varied with the region in which the land lay and with the services rendered in freeing it of all legal entanglements.

sufficient, and settlers evaded the law in every way possible in order to acquire more. Great Plains congressmen were persistent in their efforts to have the law modified and after a decade they met with a measure of success. In 1873 President U. S. Grant approved the Timber Culture Act whereby a landholder might acquire an additional 160 acres if he would plant 40 acres of it in trees. Early Kansas and Nebraska homesteaders had already initiated the movement of tree-planting and here and there on the prairies were found groves of walnut, maple, honey locust, cottonwood, Osage orange, catalpa, and other varieties, although many trees set out died because of poor soil or insufficient moisture. Under the incentive of the Timber Culture Act thousands of other trees were planted though with only limited success. Settlers were more concerned with land than with trees; consequently, many thousands of acres were as barren of trees at the end of a decade as before they were acquired under the law. Yet the law encouraged the settler in his occupation of much of the submarginal land of the High Plains. During the first 10 years of its existence, 93,246 claims were established, covering 13,637,146 acres of land, a majority of which was on the High Plains.⁷

It was not until 1877, however, that Congress went all the way in meeting the demand of Western settlers for an enlarged land-unit. Under the Desert Land Act of that year a large part of the Rocky Mountains area was classed as arid, including parts of the Great Plains States of North and South Dakota, Montana, New Mexico, and Wyoming. Within this area a settler could acquire 640 acres of land on condition that he irrigate a part of them. Still, the cost entailed hardly made individual irrigation projects feasible, and the general benefits of the law were slight.

Fraud and trickery attended the disposal of public lands on the Great Plains, and professional "locaters" and "claim jumpers" preyed on the unwary homesteader. Even fly-by-night banks offered loans to settlers at exorbitant interest rates and demanded homesteads for collateral. Farmers were encouraged to borrow on the same terms large sums to buy high-priced tools and machinery, and to meet living expenses, both necessities and luxuries. Likewise Eastern mortgage companies were represented by Western agents who made hundreds of loans in Kansas, Nebraska, and the Dakotas on the basis of \$250 and \$500 for a 160-acre farm. In many instances, however, borrowers proved too sharp even for the "sharper." They borrowed to the limit and then abandoned

⁷ Studies on the public domain and the Federal land policy are fairly adequate. For better known works, see Benjamin H. Hibbard, *A History of the Public Land Policy* (New York: The Macmillan Company, 1924); J. W. Powell, *Report on the Lands of the Arid Regions* (Washington, D. C.: U. S. Government Printing Office); Thomas Donaldson, *The Public Domain* (Washington, D. C.: U. S. Government Printing Office, 1884); and Reuben McKittrick, *The Public Land System in Texas* (Madison: University of Wisconsin, 1918).

their property, leaving the "sharper's" bank or loan company with dearly bought farms. It is estimated that an average of two and one-half settlers occupied Nebraska homesteads before one became permanent. In spite of this ebb and flow of population, however, the Great Plains were fairly well occupied by 1900.

In 1870 the farthest limit of Kansas settlements was Brookville, then a small railroad station; but two years later it had swept to the prairie uplands, 100 miles farther west. At Wilson, there were 5 or 6 houses in 1870; in 1872 there were more than 30 houses and 50 farms, each from 80 to 160 acres in size. At this same time a traveler in Nebraska wrote: "Settlements are springing up rapidly. Even the lapse of a few months makes a perceptible difference to the eye of the passing traveler." Within the decade ending with 1880, the population of Kansas had almost trebled; in 1879, Nebraska had 68 organized counties, 4 unorganized, with a population of more than 400,000. During the same period, the increase in the population of Texas was almost 100 per cent; the population of Montana, Wyoming, and the Dakotas was tripled and more than 9,000 miles of railroad were constructed within their borders. These and other Great Plains states and territories are thus represented by the census of 1880:

A DECADE OF GROWTH

<i>State or Territory</i>	<i>Population, 1870</i>	<i>Population, 1880</i>
Colorado	39,864	194,649
Iowa	1,194,020	1,624,463
Kansas	364,399	995,966
Minnesota	439,706	780,807
Nebraska	122,293	452,432
Texas	818,579	1,597,509
Dakota	14,181	135,180
Idaho	14,999	32,611
Montana	20,595	39,157
New Mexico	91,874	118,430
Wyoming	9,118	20,788

This inrush of settlers is also apparent in the distribution of Federal land areas as revealed by the census report of 1880.

GREAT PLAINS LAND TENURE, 1880

<i>States and Territories</i>	<i>Land in Farms</i>			<i>Land Not in Farms</i>	<i>Total Land Area</i>
	<i>IMPROVED</i>	<i>UNIMPROVED</i>	<i>TOTAL</i>		
Kansas	10,739,566	10,677,902	21,417,468	30,870,532	52,288,000
Nebraska	5,504,702	4,440,702	9,944,826	38,813,574	48,758,400
Colorado	616,169	549,204	1,165,373	65,167,373	66,332,800
Wyoming	83,122	41,311	124,433	62,323,567	62,448,000
Montana	262,611	143,072	405,683	92,592,717	92,998,400
Idaho	197,407	130,391	327,798	53,617,802	53,945,600
Dakota	1,150,413	2,650,243	3,800,656	90,727,344	94,528,000
New Mexico	237,392	393,739	631,131	77,743,269	78,374,400

The building of railroads across the Great Plains implemented greatly the operations of the Homestead Act. In 1862 Congress chartered the Union Pacific Railroad, providing for a line from Omaha, Nebraska, to Sacramento, California, closely paralleling the Overland Mail route. The Union Pacific Company was to build across the plains *via* the North Platte Valley and was to meet the Central Pacific from California. Both roads were to receive extensive land grants and loans of United States bonds. The Southern Pacific, the Atchison, Topeka, and Santa Fe, the Denver and Rio Grande, and the Northern Pacific were other companies that were given large acreages. The grant of land made to the Union Pacific was equal to a strip 10 miles wide reaching from Omaha to Sacramento, and that made to the Northern Pacific was approximately twice as large. With such large landholdings, the railroads inaugurated large-scale promotional campaigns to dispose of them. For example, the Atchison, Topeka, and Santa Fe and the Northern Pacific brought thousands of German and Scandinavian emigrants to the Great Plains, selling them land on a long-time credit plan.

The appearance of flourishing towns and cities on the Great Plains was concomitant with the occupation of the public domain and the rapid spread of railroads. Often what had been a small irregular tent-town at the terminus of a railroad one month would become a young city the next. Dallas, Texas, was a border town of 1,500 people in 1872 and a city of 15,000 three years later, after it was reached by the Texas and Pacific Railroad; and, similarly, Fort Worth, on the same railroad, grew from a village of about the same size in 1870 to a bustling metropolis of 30,000 by 1888. Other towns also experienced steady growth. Samuel Bowles wrote in 1869: "Council Bluffs on the Iowa bank of the Missouri River opened the year 1869 with eight thousand inhabitants having erected thirteen hundred new buildings in 1868, while Omaha, opposite, counted nearly double that number."⁸ Besides the benefits these two towns received from the railroads, they were also served by more than 2,000 miles of river navigation northward into Montana and Canada, and an equal distance southward to the Gulf of Mexico. Denver grew from a lawless town of 4,759 people in 1870 to a well-regulated city of more than 35,000 in 1880.

Evidences of settler adaptation on the Great Plains were conspicuous in pioneer enterprises. In the timbered areas west of the Mississippi and in parts of the Rolling Plains homesteaders had used rails, stone, and hedges to enclose their landholdings, but on the High Plains and prairies generally these were not available. Consequently, some other means of fencing the land had to be found. The well-known adage, "Necessity is the mother of invention," was put to the test and the

⁸ *Our New West*, p. 49. New York: Hartford Publishing Company, 1869.

result was barbed wire. Barbed wire was first manufactured in quantity at DeKalb, Illinois. Two Illinois citizens—Jacob Haish and J. F. Glidden—claimed patent rights in 1874, independently of each other. The American Steel and Wire Company soon took over the Glidden patent rights. Competition between the two interests so lowered the price of wire that before 1900 it was well within the purchase range of the average homesteader. In 1874 it sold for \$20 a hundred pounds; in 1880, for \$10; in 1885, for \$4.20; in 1890, for \$3.75; and in 1897, for \$1.80.

The appearance of the windmill was another innovation in Great Plains development. Here and there wells had been drilled to great depths, from which cylindrical, valve-tipped buckets had been used to draw water. Probably the first windmill west of the Missouri River was at Lawrence, Kansas, in 1855; but like barbed wire, windmills were not used extensively until the 1870's. Daniel Halloday, a mechanic of Ellington, Connecticut, invented the first windmill, in 1854. During the 1860's, however, windmills were largely used to furnish water for railroad locomotives. Soon after this they were taken over by the farmers and ranchers wherever subsurface water was available, and by the end of the century they dotted the prairies.

There were still other unique adaptations. During the 1880's bonanza farming was carried on within the wheat-growing region, where the prairies were free from trees and other obstructions and the task of plowing and planting was not nearly so difficult as in older settled regions farther east. The Red River Valley of Dakota was an area of large-scale enterprises. In the 1870's President George W. Cass of the Northern Pacific Railroad and Benjamin P. Cheyney, a real estate promoter, acquired possession of 12,240 acres of land, which they turned into a bonanza farm, employing Oliver Dalrymple, a successful wheat farmer, to manage it. That they met with conspicuous success is evident from the increase of their holdings. In 1888 William M. Thayer wrote: "Who has not heard of the great 'Dalrymple Farm' of Dakota? It contains seventy-five thousand acres, thirty thousand of which were in wheat last year. The original cost of the land was from forty cents to five dollars an acre. The farm has four great divisions, all of them under the supervision of Oliver Dalrymple. The four great divisions of the farm are subdivided into sections of five thousand acres with a superintendent for each. Then sections of five thousand acres are halved, giving subdivisions of two thousand five hundred acres."⁹ New equipment purchased for this farm in 1878 consisted of 38 plows, 35 harrows, 17 seeders, 27 binders, 52 wagons, and 5 threshing machines. Bonanza

⁹ *Marvels of the New West*, p. 674. Norwich, Conn.: The Henry Bill Publishing Company, 1888.

farming made such headway along the Red River Valley that by 1890 there were 82 such farms of more than 1,000 acres each. And in Kansas, Nebraska, and Texas bonanza farming was also introduced, but on a smaller scale.

Here and there along the eastern base of the Rocky Mountains are millions of acres of submarginal land little suited for agriculture. By 1885 these regions were sought out by farmers as soon as arable land elsewhere had been occupied. Cattlemen warned the confident newcomers that nature had decreed against plowing up the Great Plains turf and putting the land into farms, but they were not heeded. During wet seasons all seemed to go well. But a day of reckoning came. Following the periodic wet seasons, droughts and dust storms ruined crops, and farmers abandoned their holdings to trek eastward to more favored areas. This periodic advance and retreat was carried over into the 1900's and is still a puzzling Great Plains problem.

The best known areas beset by these adversities are the sandhills of western Nebraska (about 11,000,000 acres) and the Dust Bowl of Colorado, Kansas, New Mexico, Oklahoma, and Texas (comprising about 40 counties within a radius of 160 miles of Guymon, Oklahoma). Both regions were stricken sorely by the drought and dust storms of the 1930's. Many dusters blew billions of tons of fine soil for hundreds of miles into neighboring states and left behind thousands of sand dunes and sterile soil. Professor A. B. Sears, in his excellent article, "The Desert Threat in the Southern Great Plains; The Historical Implications of Soil Erosion," states that the "dust storm of March 11, 1939—probably the worst in history—took enough soil from the Dust Bowl into Oklahoma alone to cover 5 million acres a foot deep, assuming that the fall over the entire state was as great as at Stillwater."¹⁰

For many years prior to 1930 submarginal farmers had been attempting by dry-farming methods to wrest a meager livelihood from these areas. They believed that by deep plowing and planting, and by frequent stirring of the soil, enough of the spring moisture could be retained to grow kaffir corn, milo maize, beans, and even wheat. And year after year their faith in the country was justified. Millions of bushels of wheat were grown and other crops in like proportion. But lean years followed fat years. A prolonged drought and the many dust storms of the 1930's swept away the savings of bountiful years and drove the "Oakies" to seek employment on the Western Coast. Repeatedly, in the past, Great Plains legislators had called the attention of Congress to the submarginal land problem. But it was not until 1934 when dust

¹⁰ *Agricultural History*, Vol. XV (January, 1941), No. 1, p. 6. Another study of the Dust Bowl is C. W. Thornthwaite's chapter, "The Great Plains," in Carter Goodrich, ed., *Migration and Economic Opportunity* (Philadelphia: University of Pennsylvania Press, 1936), pp. 202-250.

blown from the Western plains actually settled as a pall on Washington and New York that Congress responded with remedial legislation. Relief appropriations were then passed for the destitute farmers and a National Resources Committee was created to apply scientific methods to the conservation of Western land and water.

Generally, New Deal measures followed along two lines. First, the United States Forest Service planted more than 24,000,000 trees along the eastern border of the Great Plains from Canada to the Panhandle of Texas as a shelter belt to conserve moisture. This measure was challenged by seasoned plainsmen who insisted that the treeless condition of the country was proof enough that it would not succeed. Then, second, field agents of the Department of Agriculture were sent to the Dust Bowl to teach farmers how to erect terraces and contours to guard against erosion and to instruct them as to what crops were best suited for the soil. There is little doubt that both measures met with some encouraging results. One authority states that within four years after the launching of the new program in 1934 the Dust Bowl was reduced from an area of 15,000,000 acres to 1,500,000. But much work remains to be done.

Petroleum and Manufacturing

The discovery and commercialization of petroleum on the Great Plains have compensated to some extent for soil depletion and dust storm ravages. The first oil well was drilled in a Southern Plains state in 1866, at Chireno, in Nacogdoches County, Texas. But it was not until 1901 that the production and sale of oil in this vicinity attracted more than local interest. Meanwhile in 1899, a commercial well was drilled near Chelsea, in present northeastern Oklahoma, and oil therefrom was hauled to Independence, Kansas, to grease the tracks of the streetcars. In the same year other wells near Paola, Kansas, yielded a total of 500 barrels of oil, augmented by similar discoveries at Fort Scott, Wyandotte, and Coffeyville. Indeed, by 1900 exploratory drilling had brought into operation other fields, and Kansas sold 74,714 barrels of oil valued at \$69,142. Nor were Indian Territory and Texas far behind, the latter state producing in that year 836,039 barrels of oil valued at \$871,996.

But it was not until after 1901 that "black gold" literally poured from Southern Plains treasure houses. After the discovery of the Beaumont Spindletop Pool in 1901, other fields appeared in quick succession: Sour Lake in 1902; Batson in 1903; Saratoga and Matagorda in 1904; Humble and Dayton in 1905; and Blue Ridge in 1908. Soon leasing and exploratory drilling were undertaken in all parts of the Southwest. Newly organized oil companies spent hundreds of millions of dollars for leases and royalties; producers laid hundreds of miles of pipe lines to carry the crude oil to storage tanks; and refineries gave to waiting buyers

millions of barrels of kerosene, gasoline, and other oil products. Vast fields, each dotted by hundreds of oil derricks and many refineries, appeared near Tulsa (the Glenn Pool, 1905), Wichita Falls (1911) and Burkburnett (1912), Ranger (1917), and Oklahoma City (1928); and numerous smaller discoveries were made elsewhere. Southern Plains pools near Amarillo and Borger, Texas, and Hobbs, New Mexico, carried still farther west "wildcat" endeavor. By 1919 the Southwestern states produced 216,000,000 barrels of crude oil, valued at more than \$445,-000,000; and billions of dollars were invested in oil properties.¹¹ Twenty years later Texas, Oklahoma, Kansas, and Wyoming produced 726,739,-000 barrels of a total national petroleum output of 1,264,256,000 barrels.

As a region, the Great Plains, since the dawn of the twentieth century, have shared with other geographic provinces in great economic development, much of which has been in manufactures. Among the many kinds of goods produced at the present time in Great Plains cities and towns are iron and steel products, Portland cement, machinery, cotton goods, flour, and feedstuffs. Census figures of 1937 show the following distribution of manufactures by states:

<i>State</i>	<i>Number of Manufacturing Industries</i>	<i>Value of Products</i>
North Dakota	340	\$67,276,395
South Dakota	434	56,025,617
Nebraska	1,071	282,502,287
Kansas	1,526	543,807,190
Oklahoma	1,428	366,088,721
Texas	4,422	1,581,422,401
Montana	515	176,278,814
Wyoming	235	49,128,729
Colorado	1,233	237,838,370
New Mexico	241	20,598,868

Benefits derived from farming, ranching, the petroleum industry, and manufacturing have been major factors contributing to the growth of cities on and adjacent to the Great Plains. Denver, which A. D. Richardson described as a small village in 1857, had grown to a metropolis of 318,415 by 1940. Omaha, a struggling young railroad town of a few thousand souls in 1869, developed into a city of 223,185 people by 1940. Oklahoma City and Tulsa were nonexistent during Major General P. H. Sheridan's winter campaign against the Indians (1868-1869), but they were cities of 204,517 and 141,750 respectively by 1940. Many other young cities—Fargo, North Dakota; Sioux Falls, South Dakota; Albuquerque, New Mexico; Wichita, Kansas; and Amarillo and Wichita Falls, Texas—are rapidly forging to the forefront to claim municipal greatness. And with hard-surfaced highways, railroads, telephone, telegraph, and electric power lines, and public utilities, they offer advantages to villages

¹¹ For a well-written story of the industry see Gerald Forbes, *Flush Production*. Norman: University of Oklahoma Press, 1942.

and farm and ranch communities for a hundred or more miles about them.

The Great Plains have advanced far on the road of a regional economy. After many years of trying experience, their pioneer settler evolved into a seasoned plainsman, inured to hardship and conditioned in mind to attack with some degree of success the many novel problems all about him. Not having logs, he built his cabin of sod and fenced his homestead with barbed wire. To procure water in a semiarid land, he dug a ground tank or a cistern, or drilled a deep well and erected over it a windmill. If he engaged in farming, he had to plant and plow his crop to suit the seasons, to calculate on periods of drought, blizzard, and dust storm, to select a drought-resisting product for his planting, and to acquaint himself with dry farming. In the course of time, his peculiar needs were met by such inventions as barbed wire, the windmill, the gang plow, the harvester combine, and the wind-charger. Although bonanza farming was not common on the Great Plains during pioneer days, it was uniquely suited to the region, and ultimately an adequate land-unit was found to be larger than in more humid areas. But all these conditions and adaptations were only the basis of Great Plains economic life. On them the modern plainsman has built. His cities and towns, transportation and communication systems, farming, stock-raising, and industrial enterprises have been shaped and developed to meet his needs. And today, as in the past, wind, drought, blizzard, treeless plains, and semiaridity must be reckoned with in planning for economic stability.

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CHAPTER 20

The Processing of Agricultural Products After 1860

AFTER 1860 the agricultural processing industries pretty generally passed into the factory stage. At the same time, they expanded in number and importance, in variety of products, and in volume of output. Industries unknown before 1860, such as candy manufacture, the bottling of carbonated beverages, and the production of vegetable oils, appeared on the scene. Other industries that had started before 1860, such as factory production of dairy products and commercial baking, now grew to major importance. Still others, well established before the War Between the States, experienced radical changes in techniques of production and in business organization and management. In all these industries, large-scale production, increasing mechanization, a tendency to concentrate in certain cities or areas, and some elements of monopoly appear after 1860.

Meat Packing

Rise of the Chicago meat industry

Even before Chicago's townsite was laid out in 1829, hogs were being driven in from considerable distances to supply the garrison of Fort Dearborn and the inhabitants of the trading post. As population grew, slaughterhouses were established and pork products began to be shipped East over the lake route. Up to 1850, however, Chicago was not an important center of the industry. The territory north and west of the city was as yet but sparsely settled. There were no railroads into that area and only the lake steamers to give access to Eastern markets. In 1848 there were only six packing houses in Chicago, and their combined output was less than one-tenth that of the Cincinnati packers.¹

In 1848 the Illinois and Michigan Canal was completed, and in the same year the Chicago and Galena Railroad was opened to service. Together they brought prosperity to Chicago. Hog-raisers who formerly had driven their animals to local markets in central and northern Illinois now shipped them to the new center. The immediate financial success

¹ See H. C. Hill, "The Development of Chicago as a Center of the Meat Packing Industry," *Mississippi Valley Historical Review*, Vol. X (1923-4), pp. 253-273, for a detailed study of this topic.

of the Chicago and Galena line inspired the building of other railroads to the Eastern markets and westward into new territory being opened up beyond the Mississippi. Improved transportation not only drew larger supplies of cattle and hogs to the Chicago market, but it stimulated shipments of meat to distant Eastern markets. Between 1852 and 1860 the number of cattle packed in Chicago doubled and the number of hogs slaughtered tripled. By 1864 Chicago had become the leading packing center of the country.

Of course, this growth was not due solely to the influence of transportation. In the decade after the War Between the States many of the farmers in the Chicago territory changed from wheat raising to corn growing. The change-over was accelerated by the chinch-bug, by wheat-rust, and perhaps by "wheat-sick" land. Many farmers in the western part of the new Corn Belt found it profitable to buy range cattle and fatten them for the market. Pigs are a good side line for the cattle raisers: they can be combined with cattle because they eat what cattle waste and they can be pastured with the cattle. Consequently, the popularity of corn growing caused a phenomenal growth in the number of hogs raised in the Corn Belt states, especially after 1860.

By that date the railroads had opened up large areas west of the Mississippi for cattle raising. Cattle ranching has always been associated with frontier life. Great herds raised in Texas moved over the cattle trail to the northern ranges and then were shipped to Chicago for sale to the packers.

A minor but not unimportant cause of the growth of packing in Chicago was the development of the Union Stock Yards. The slaughterhouses at first provided their own storage facilities: pens for the hogs, and pastures at the outskirts of the town for the cattle. Then the railroads established stockyards in various sections of the city, each railroad for a time having its own yard. In 1865 nine railroads combined to establish the Union Stock Yards. Covering 300 acres and containing facilities for unloading 500 cars at a time, they were the largest stockyards in the world. Both as a market for buying and selling livestock and as a system of physical distribution, they became a model for other yards that were established later in the newer centers.

In Chicago, as in Cincinnati, the packing industry was at first almost exclusively interested in hogs. Before the development of refrigeration, fresh beef could not be shipped any considerable distance except during the winter months. The demand for packed beef seldom exceeded 10 per cent of the beef supply. But anywhere from one-half to two-thirds of the hogs could be packed. Thus there was a larger steadier market for pork, and this was the more attractive branch of the industry, until refrigeration changed the picture.

New leaders in the packing industry

New developments in packing are associated with the rise of the captains of industry in this field. Some of them were immigrants who had acquired experience in packing in Ireland, Germany, and other countries. Some were men who had started as cattle traders or packers in Eastern cities and then migrated to the West. Still others got their start in the Middle West. Perhaps the ablest of them all was Gustavus F. Swift, who had started as a New England cattle dealer and butcher. Located originally in Boston, he moved west as a cattle buyer first to Albany, then to Buffalo, and finally to Chicago. He started cattle buying in Chicago in 1875 and in 1877 established a packing plant.²

Philip Armour started a produce and commission business in Milwaukee in 1859. Some three years later, with his brothers as partners, he started a grain business in Chicago, and at the same time became a partner of John Plankinton in a packing plant in Milwaukee. During the War Between the States Armour progressed rapidly, partly from the profits of a rising pork market and partly through speculative dealings in grain. In 1867 the firm of Armour & Company started packing hogs in Chicago. The partnership with Plankinton continued for a number of years longer, and then the firm was consolidated with Armour & Company.³

A third notable packer was Nelson Morris, who came to Chicago in 1859. When the Chicago stockyards were established, he became an important cattle dealer. In the 1870's he made large shipments of live cattle to the European market and presently established a packing house.⁴ His was one of the first packing houses to be built near the Union Stock Yards. Gradually almost all the plants were moved into that neighborhood.

Whereas Armour and Morris were primarily interested in pork-packing, Swift concerned himself with the marketing of beef in the Eastern consuming centers. Boston, New York, and Philadelphia had local firms engaged in slaughtering and distributing fresh beef. These naturally tried to get shipments of live cattle from the West, but transportation was slow and facilities for handling livestock bad. A large proportion of the animals died on the way, and the shrinkage in the rest caused serious loss. Nor did the Eastern slaughterers operate

² A. Van Vliissingen and L. F. Swift, *The Yankee of the Yards* (Chicago: A. W. Shaw Company, 1927), is an interesting and valuable account of Gustavus Swift.

³ H. Leech and J. C. Carroll, *Armour and His Times* (New York: D. Appleton-Century Company, 1938), gives a detailed account of Philip Armour's life with many quotations from his letters.

⁴ He first secured employment in the stockyards, "then began buying smothered hogs for rendering purposes, and finally engaged in the slaughtering of cattle." Hill, "The Development of Chicago as a Center of the Meat Packing Industry," p. 268.

on a scale sufficiently large to enable full utilization of by-products. Only about half of the animal could be used for meat; the rest (except the hide) was wasted. Swift saw that the remedy for these conditions was to be found in doing the slaughtering at Western centers and shipping fresh beef to the Eastern markets. For a time he confined his efforts to shipments during the winter months. It was the development of refrigeration that brought a revolution in the industry.

Refrigeration revolutionizes the industry

Refrigeration began in the slaughterhouses. Up to about 1860 even the slaughtering of hogs was confined to the winter months. Then the packers found it possible to slaughter successfully in warm weather by placing crates of ice and salt about the slaughterhouses. Wherever ice was cheap, it was possible to build large refrigerator chambers, so by 1870 all the larger plants had cooling rooms chilled with natural ice. Thus slaughtering could be carried on continuously through the year.

By that time Swift and other packers were experimenting with shipments in freight cars iced in various ways. Repeated failures did not daunt the persistent "Yankee of the Yards." Finally one of Swift's engineers discovered the principle of air circulation, as applied to refrigeration, and designed a practical refrigerator car.⁵ As soon as Swift had demonstrated its practicability, the other Chicago packers adopted it. By 1880 this type of car was being regularly used for shipments from the West. As a result, sales of fresh beef to Eastern markets rose with great rapidity. In 1875 Chicago packers had slaughtered 250,000 cattle. The number was doubled in 1880 and doubled again by 1890.

The packers had need to be persistent, for the new development met with a great deal of opposition. The Trunkline railroads refused to build refrigerator cars. They did not want to take the risk and undergo the expense while the cars were still an experiment. If the experiment proved successful, they would lose a large volume of traffic in cattle cars and in stockyards in Eastern markets. So Swift found it necessary to build his own refrigerator cars, and for some years he ran them to the Atlantic Seaboard over the Grand Trunk Railway of Canada, which was not a member of the Trunkline Association. Opposition came also from the local butchers. Many of them refused to handle Chicago beef. They tried to convince their customers that the refrigerated beef was inferior in quality if not altogether unfit for consumption. In some states the legislatures were induced to pass hostile legislation. Virginia, for example, required that all fresh meat offered for sale in that state

⁵ The principle of car refrigeration is to keep a current of fresh chilled air in constant circulation about the meat, which is hung in the car in such fashion that the air currents can reach every part. Hill, "Development of Chicago as a Center of the Meat Packing Industry," p. 273.

must be slaughtered within one hundred miles of the place of consumption.

Shrewd management was able to overcome this opposition. Swift met the antagonism of the local butchers by setting up distributing firms in Eastern centers, in which he took local men into partnership. Armour and Morris set up branch houses from which to distribute their products. "The Swift partnerships were the best for immediate results but the branch house proved superior in the long run so that eventually Swift also adopted that method."⁶ Careful and persistent advertising slowly overcame the prejudice against Western beef, although for years it had to be sold in Eastern markets at lower prices than native beef. The opposition of the railroads was overcome by the payment of proportionately higher freight rates on beef than on live cattle and by the willingness of the packers to assume the burden of providing and servicing the refrigerator cars.

The introduction of the refrigerator car accelerated the revolution in the packing industry. The packers could now set up an all-year industry and sell to a national market. To meet the demands of that market, they had to develop slaughtering and packing capacity to meet sudden or unusual demands. This meant large cold-storage facilities in which supplies could be accumulated for peak periods or withheld from the market when demand unexpectedly fell off. All these things involved heavy outlays, large capital, and an increase in the size of the business unit. Armour & Company, for example, showed a net worth of \$200,000 in 1870. By 1880 this had risen to \$2,500,000, and by 1890 the figure was \$10,500,000. Large-scale production, in turn, created serious marketing problems for the packers. The refrigerator car put them into the transportation business. In order to avoid the waste of hauling empty cars back to their plants and in order to provide a full load for outbound shipments, it was necessary for the packers to engage in the buying and selling of various other products. Fruit, butter, eggs, cheese, and many sorts of vegetables were brought from every part of the country in the returning refrigerator cars. A marketing and storing organization had to be built up to handle these products, and thus the packers became produce merchants on a very large scale. Meantime the system of branch houses had been expanded, so that Armour, for example, had 40 such branches by 1890. To reach retailers distant from their branches, "peddler cars" were put in service and later automobile trucks were used.

The introduction of refrigeration also meant an expansion in the utilization of by-products. The local butcher threw away almost half of the animal because he had no plants to utilize such waste products. His

⁶ Malcolm Keir, *Manufacturing*, p. 270. New York: Ronald Press, 1928.

scale of production was too small to justify an effort to use them. But the large-scale packer saw an opportunity in this waste. Even before 1875 there were plants in Chicago processing lard, lard oil, tallow, soap, glue, and fertilizer. These were allied industries rather than an integral part of the packing industry. After 1875 the packers took the manufacture of by-products into their own hands. Armour took over an established glue factory in 1884; somewhat later he began to make soap. A new invention made it possible to use fats, hitherto useless, for the making of oleomargarine. This became a thriving part of the industry by 1880. Then the packers set up research laboratories to study the problems of waste utilization. As a result one line of research has developed some 50 pharmaceutical and medical preparations. To find a market for some by-products, it was necessary to combine them with products of other industries, a development that led to further expansion. For example, to utilize the large quantities of glue they were producing, the packers engaged in the manufacture of sandpaper. In utilizing wastes, other wastes were created which, in turn, became raw materials for other by-products. Including merchandised as well as processed products, a modern packing house may sell nearly 700 different items.⁷

New centers of production after 1890

Once the shipment of fresh meat had become the main business of the packers, it became economical for them to establish their plants as close to the sources of supply of livestock as possible. After about 1890 new centers of packing developed rapidly on the western edge of the Corn Belt. In the Southwest the practice of fattening cattle on cottonseed meal, a by-product of the cottonseed oil industry, helped the new centers. The use of mechanical refrigeration also made it easier to carry on packing in the Deep South. In 1890 the centers of packing, ranked by value of product, were Chicago, Kansas City, New York, Indianapolis, and St. Louis, all but Kansas City east of the Mississippi River. By 1914 three out of the five states leading in packing were west of the Mississippi River: Kansas, Nebraska, and Missouri. Omaha after 1885, St. Joseph after 1897, and Fort Worth, Dallas, and South St. Paul after 1900 had become important centers.

Concentration of control and public regulation

The growth of packing in these other areas did not eliminate the dominance of the Chicago packers; indeed, their security was strengthened, since the plants in these new centers were established and controlled by the Chicago firms, particularly the four big companies. In 1890

⁷ See R. A. Clemen, *By-Products in the Packing Industry* (Chicago: University of Chicago Press, 1927), for a detailed discussion.

these were Armour, Swift, Morris, and Hammond. They were not only the largest producers; they were large stockholders in the stockyards and the stockyards railway companies; they controlled the banking facilities of the stockyards districts and the refrigerator car services. When, early in the 1890's, American admiration of big business turned to fear and dislike, the packing business was particularly a target. Livestock raisers were dissatisfied with the prices they received and accused the packers of manipulating markets. Smaller packers accused the large companies of using their control of the refrigerator cars to the disadvantage of the small producers. Cottonseed oil manufacturers, tanners, soap manufacturers, and makers of fertilizer resisted the packers' intrusion into their fields. Wholesale grocers were alarmed at the way the packers constantly enlarged their share of the distributing trade. Local slaughterers accused them of driving the small men out of business. Consumers knew that meat prices were rising, and they held the big packers to blame.

In 1890 an investigation committee of the United States Senate accused the Big Four companies of restraint of trade by collusion as to price fixing, division of territory, and other reprehensible activity. This Senate report was at least partly responsible for the passage of the Sherman Anti-Trust Law. Monopolistic practices continued, however, culminating with the formation of the National Packing Company by Armour, Swift, and Morris as a means of buying up and merging their smaller competitors. In 1912 the Government forced the dissolution of this company. In 1919 a Federal Trade Commission report again accused the five leading packers—now Swift, Armour, Morris, Wilson, and Cudahy—of monopolistic practices. Their monopoly, it was stated, was based not only on the large proportion of the packing business that they handled (from 61 to 86 per cent of the principal lines), but also on their control of stockyards, refrigerator-car lines, cold-storage plants, and branch houses. The litigation that followed was ended by the famous Consent Decree, in which the packers were enjoined from monopolizing, or attempting to monopolize, public stockyards, stockyards railroads and terminals, market newspapers, public cold-storage warehouses, and the retail meat business. They were also forbidden to engage in the manufacture or sale of certain enumerated wholesale-grocery lines not related to the meat industry. But when, some years later, the packers asked relief from some of the provisions of the Consent Decree that limited their efforts to distribute dairy products, the Federal Trade Commission opposed their request on the ground that they had failed to carry out the terms of the Decree.

After this request of the packers was denied in 1931, the public agitation against the big packers died down, partly because of the relatively rapid growth of a considerable number of medium-sized independent

plants west of the Mississippi, which, it was hoped, would restore competitive conditions in the industry. As a matter of fact, there is evidence of real competition. The Big Four still sell about half the total volume of packing-house products. In 1940 Swift led with sales of \$772,000,000, with Armour, Wilson, and Cudahy not very far behind. As compared with these four, there are a number of medium-sized firms doing a regional rather than a national business—such as Hormel, Morrell, Rath, and Jacob Dold. Besides these there are still smaller local packers buying livestock and selling manufactured products only in their own neighborhoods. Both groups have definite advantages and seem to be holding their own. But Swift and Armour remain the big names in the industry. Their founders had created a new industry “transforming the primitive farm smokehouse and the village slaughterhouse into the new and fast growing order of cities, steam-powered factories and railroads.”⁸ They had become great manufacturers, but even greater merchants. “Today the problems of the packing industry do not lie so much in the management of the great plants, processing systems and storage warehouses, which are its visible evidences, as in the distribution and merchandising of the products.”⁹ That the Big Four have become more distributors than manufacturers is evidenced by the fact that over half their expenses are now made up of freight and selling costs.

Flour Milling

Growth of the Minneapolis mills (to 1890)

There were no important technical changes in flour milling in the decade of the War Between the States. In the East, Baltimore, Richmond, and Rochester were the principal centers of production. In the West, St. Louis outshone all the rest, although Chicago and Milwaukee were important. New York, Pennsylvania, and Illinois ranked first, second, and third among the states in the value of flour produced in 1870. The mills were generally small and widely scattered. Soft red winter wheat was the chief variety grown in those states and was considered to make the best bread flour.¹⁰

In 1870 Minneapolis flour mills were beginning to attract national attention. The first mills at the Falls of St. Anthony ground wheat for the logging crews and sawmill workers of Minnesota's pioneer days. At first grain was brought up the Mississippi by boat from older settlements. When wheat growing became well established in Minnesota, the farmers grew spring wheat, for the more popular winter wheat was not

⁸ H. Leech and J. C. Carroll, *Armour and His Times*, p. 3.

⁹ R. A. Clemen, *By-Products in the Packing Industry*, p. 10.

¹⁰ The soft red winter wheat area extends from Pennsylvania westward to the Mississippi River.

able to stand the rigors of the Minnesota winter.¹¹ Spring wheat presented new problems for the millers. While richer in gluten and making a "stronger" flour, its hardness made it less easy to grind. The millstones had to be run at higher speed with greater pressure. The heat thus generated discolored the flour, and the husk of the wheat kernel broke into fine powder that was difficult to sift out. The germ of the wheat berry ground into the flour injured the flour's keeping qualities. Thus, up to 1870, winter wheat flour was whiter, kept better, and was generally preferred in the Eastern markets. Yet by 1870 there were 13 flour mills in Minneapolis producing some 250,000 barrels of flour a year. There were also important mills in some of the river towns of Minnesota south and east of Minneapolis. The leading millers of the state were all experimenting with improved methods of milling designed to overcome these objections to spring-wheat flour.

Out of their experiments developed "New Process" milling. Essentially it involved multiple grinding with slower speed and reduced pressure on the millstones to prevent discoloration of the flour. The process increased the production of "middlings," which when purified and re-ground produced the best flour. The problem of purifying the middlings stumped the experts for a time, until in 1871 a miller named La Croix built a machine (apparently based on a French design) that performed the operation successfully.¹² The middlings purifier made the New Process a commercial success, and this fact in turn gave spring-wheat flour a dominant position in consumer markets. For a time the Minneapolis mills could hardly turn out flour fast enough to satisfy their customers. The Washburn "A" Mill in that city is said to have been built out of two or three years' profits of the "B" Mill.

Their experience with the middlings purifier induced the leading Western millers to turn to Europe for further ideas. They studied French and German milling practices, in particular, Hungarian milling, because their mills were dealing with similar problems. The Hungarian wheat was also hard with a brittle husk. Their millstones wore out rapidly and the quality of their flour was injured by the fine grit from the stones. The Hungarian millers were the first to experiment with roller grinding machines as a substitute for millstones.

The first roller grinders were introduced in Minneapolis in 1873. Used originally to regrind the purified middlings, their use was soon extended to all grinding operations. The first complete roller mill in America was set up in Minneapolis by Governor Washburn in 1878. The superiority of the rollers was quickly recognized, and their use

¹¹ In recent years new hardy varieties of winter wheat have been introduced and grown successfully.

¹² See C. B. Kuhlmann, *Development of the Flour Milling Industry in the United States* (Boston: Houghton Mifflin Company, 1929), pp. 115-120, for a description of the La Croix invention.

spread rapidly along with the multiple grinding process. The roller grinders took up less space, used less power, and required less oversight. Millstones had to be "dressed" every three or four days, while the rollers could run for months without change. The flour yield from a given amount of wheat was somewhat larger and, owing to the absence of millstone grit, it was of better quality.

The Minneapolis millers took the lead in introducing these improvements and reaped the greatest benefits. By 1882 the 13 mills of 1870 had doubled in number and were turning out over 3,000,000 barrels of flour a year. Not only did these mills dominate the domestic market but they were making rapid progress in conquering the markets of northern and eastern Europe: "As early as 1878 a solid train of cars carrying 2,500 barrels of flour reached New York after an unbroken trip from Minneapolis, to make connection with a steamer which would deliver the consignment in London sixteen days from the time it left the Falls of St. Anthony."¹³

By 1885 the Minneapolis mills were producing over 5,000,000 barrels of flour annually; by 1890, over 7,000,000. They had outdistanced all their rivals. Certain causes of their extraordinary success may be pointed out. One was the growth of large-scale production. In 1876 the average capacity of the Minneapolis mills was 242 barrels a day; by 1890 it was 1,837 barrels. In the 1880's the trade papers were pointing out the superior advantages of the larger mills: advantages in buying and selling, in better superintendence, in ease of securing capital, and in filling the large orders customary in foreign trade. Except perhaps in Richmond, this enlargement of the scale of production was most prominent in Minneapolis. There was also a concentration of ownership, so that by 1890 seven-eighths of the milling capacity of the city was combined in four large corporations.

These mills required large wheat supplies: much larger than could be obtained from local territory. The Minneapolis millers, therefore, found it necessary to push the westward expansion of the railroads into the wheat-producing area. How far the millers were responsible for the development of the Twin Cities as a transportation center is debatable; but unquestionably they benefited from the fact. To free themselves from any domination by the railroads centering in Chicago, millers promoted the building of the Minneapolis, St. Paul, and Sault Sainte Marie (the "Soo line") eastward across Wisconsin and the upper peninsula of Michigan to a connection with the Canadian Pacific Railway in 1888. Rival centers subsequently claimed that the Minneapolis millers used their strong position to secure discriminating freight rates for themselves.

¹³ V. S. Clark, *History of Manufactures in the United States*, Vol. II, p. 504. New York: McGraw-Hill Book Company, 1929.

When the production of wheat spread from Minnesota into the Dakotas, the marketing of wheat also had to be organized. Subsidiary companies organized by the millers built up lines of elevators along the railroads throughout the wheat area. An effort, as early as 1869, to prevent competition in wheat buying by forming a single buying agency to purchase for all the mills (the "Millers Association") was successful for a time but created a good deal of enmity against the millers among the farmers. The milling interests took the lead in developing the Minneapolis Chamber of Commerce, organized in 1881. Through its efforts Minneapolis became the marketing center for wheat of the Northwest.

The mills required large amounts of capital, much of which came in the early days from the lumber industry of Minnesota. By the 1870's the millers were securing funds from Eastern financial institutions. Then the building of a group of strong local banks, in which the flour manufacturers played a leading part, made them secure in their capital needs. It was stated in 1889: "Nearly all the money paid for grain in the interior is sent from the city by elevator companies and millers, to their agents in the country. Thus Minneapolis is not only the market to which the grain is shipped and where it is sold, but the financial center from which the money is sent out to purchase and move the grain crops of the Northwest."¹⁴

Rise of milling in the hard red winter wheat area

After 1890, Minneapolis mills were faced with competition from new milling centers. The settlement of the territory west of, and tributary to, Kansas City was roughly contemporaneous with that of the Minneapolis area. Mennonite settlers from Russia are said to have brought the Turkey Red wheat into Kansas as early as 1872. This hard red winter wheat was improved as other varieties of the same general type were introduced or developed by experiment. Because these wheats gave a heavy yield and produced a good bread flour, they spread rapidly. As a result, Kansas in 1892 led all the states in wheat production. Kansas City, important as a wheat market by 1880, began to grow as a milling center after 1890 as the excellent qualities of Turkey Red wheat were generally recognized. By 1901 the city was producing over a million barrels of flour annually. Millers from St. Louis, Philadelphia, and New York erected large new plants there, the development culminating in 1922 when Washburn-Crosby of Minneapolis acquired a Kansas City mill.

Meantime the new hard red winter wheats were spreading beyond Kansas into Oklahoma, Texas, Colorado, and other states. In 1923 the

¹⁴ Minneapolis Chamber of Commerce, *Annual Report*, 1883, p. 120.

total production was 241,000,000 bushels: almost double the Northwest's hard red spring wheat crop of 126,000,000. Many new mills of large size were built to process this grain, notably in Wichita, Salina, Hutchinson, and Topeka in Kansas; in Dallas, Fort Worth, and San Antonio in Texas; and in Oklahoma City, Oklahoma. In marketing their rapidly expanding output, these producers came into competition, not only with Kansas City mills, but also with those of the older centers in Minnesota and the East. For a long time the Kansas millers had to accept lower prices on their flour than was paid for the Northwestern flours. Even now spring-wheat flours, grade for grade, are slightly higher in price. As against this, Kansas millers are able to buy wheat at somewhat more advantageous prices and their costs of operation are somewhat lower. Because of a rapidly expanding demand, they were for years able to get better prices for mill-feeds. As a result, millers operating simultaneously in the Minnesota, Kansas, and Buffalo districts have testified before the Interstate Commerce Commission that Kansas flour is laid down in New York at the lowest cost, Buffalo at the next lowest, and Minnesota at the highest.

Buffalo as a milling center

Buffalo had a flour mill as early as 1832, and a number of other mills were built before the War Between the States. By 1885 Buffalo had 10 mills producing annually about 750,000 barrels. In the following decades milling languished, and Buffalo seemed destined to be a distributing point for lake shipments from the Minneapolis mills because of the practice by which the railroads granted the Western millers free storage for their flour at Buffalo. Appeals were made to the Interstate Commerce Commission against this practice, and it may be that the decision of the railroads in 1901 to withdraw the privilege was the turning point in the struggle. At any rate, Buffalo flour production increased rapidly after that date, not because of the expansion of old, established companies, but because Minneapolis millers moved to Buffalo. First of these was the Washburn-Crosby Company, which built a large mill in Buffalo in 1903, later enlarged to 22,000 barrels' capacity—the largest mill in the world. Ultimately all the larger Minneapolis companies acquired mills in Buffalo. With the withdrawal of the free-storage privilege, and since the lake rates were relatively lower on wheat than on flour, the Minneapolis mills were at a disadvantage. Buffalo is favorably situated for distribution to Eastern markets. Not only can Buffalo mills get Northwestern wheat by lake steamer at low rates, but low-cost Canadian wheat as well. Canadian wheat can be milled in bond and the flour exported. This privilege has caused Minneapolis millers to transfer virtually all their export orders to their Buffalo mills. Lastly, cheaper power is available in Buffalo. As these advantages became generally recognized,

new mills were built and Buffalo production increased steadily. Minneapolis production, on the contrary, decreased rather rapidly after about 1922. In 1930 Buffalo passed Minneapolis in output, and it is now the nation's largest milling center.

Decline of Minneapolis as a milling center

The decline of milling in Minneapolis merits, perhaps, some further comment.¹⁵ Some of the causes for this decline have been noted above. To these might be added the fact that after the First World War freight rates rose generally throughout the country, tending to decentralize the industry. Minneapolis millers moved not only to Buffalo and to Kansas City; they also acquired mills in the soft wheat area, the Pacific Coast area, and the Inter-mountain territory. The growth of the chain stores, which promoted their own private brands, was unfavorable to the heavily advertised brands of the big Minneapolis mills. The shift from home baking to the buying of bakery products and the rise of large-scale baking had a similar effect. These bakeries in their flour purchases were likely to consider price rather than quality. They could not afford to pay higher prices for widely advertised manufacturers' brands.

The main cause of the decline of Northwestern milling, however, is to be found in the decrease of Northwestern wheat both in quality and in quantity. In part this decrease is due to the use of inferior varieties of wheat, which have been adopted because they were supposedly more rust-resistant. In part it is the effect of the replacement of bread wheat by "durum" wheat, which is used not for bread but for macaroni and similar products. Northwestern farmers have been unable to rotate their crops as successfully as the farmers of the Southwest, and consequently weeds keep down the yield. To the extent that the farmer has practiced diversification, it has cut down the acreage devoted to wheat. In Minnesota especially, the wheat raiser has given way to the dairy farmer over a large area.

Combinations in the milling industry

After 1890 the milling industry experienced a new movement toward concentration of ownership and control. A number of English importers of American flour, impressed with the profits of the Minneapolis mills, were induced to invest money in a merger of two companies there. In 1892 a combination of New York City mills was formed, and other consolidations were effected in other centers, notably in St. Louis. Then in 1899 came the attempt to form a trust by a consolidation of all the leading spring-wheat mills. The United States Flour Milling Company

¹⁵ See V. G. Pickett and R. S. Vaile, *The Decline of Northwestern Flour Milling*. Minneapolis: University of Minnesota Press, 1933.

was organized to acquire control of 24 mills in New York City, Minneapolis, and Superior with a combined output of from 40,000 to 50,000 barrels a day. It failed, however, to get control of the two largest Minneapolis companies, and without them it could exercise very little monopolistic control. Various other combinations were formed after 1900, most notable being that by which the Washburn-Crosby Company secured control of several groups of mills in Kansas, Texas, and California, combining them under the name of General Mills.

The result of these combinations has been to bring flour milling pretty much under the control of a few large companies. Over half the annual output is produced by 13 companies. The three largest companies—General Mills, Pillsbury, and Archer-Daniels-Midland—have daily capacities of about 70,000, 37,000, and 25,000 barrels, respectively, and between them they produce fully 30 per cent of all the flour made in the United States.

The growth of these large companies has not killed off the small mill. *The Northwestern Miller* estimated in 1940 that there were 3,400 mills with a daily capacity of 730,000 barrels of flour. But actual production of the smaller mills is not proportional to capacity. The large mills, those producing over 100,000 barrels of flour a year, are increasing their share of the total output. Some of the advantages of large-scale production have been indicated. Perhaps the principal one today is their ability to produce a standard, uniform grade of flour year after year. This can be done only by mills that are large enough to draw their wheat supplies from a large area and that have laboratory equipment and a staff that is able to blend the various wheats in such a way as to secure absolute uniformity. The growth of large-scale baking has been important in creating this demand for uniformity. The concentration of wheat growing in certain areas has favored large-scale processing.

Diversification of products

The breakfast-food industry, which arose shortly before 1900, was at first a separate enterprise from flour milling. The early millers were disposed to dispute the exaggerated claims for the new breakfast foods. It was not until these controversies were forgotten and breakfast food firmly established in the American diet that the large milling companies invaded the field. Washburn-Crosby, for example, built a cereal mill in Chicago in 1923, and since that time all the leading mills have been active in that field. At the same time, they have diversified the products of their flour mills, making corn meal, rye flour, and other products. In recent years there has come a demand for prepared pancake flour, cake and biscuit mixtures, and similar products. The native-born population as well as the foreign-born are eating increased amounts of macaroni products made from durum wheat. The net result has been

an increasing diversification of mill products as the millers have responded to these new demands.

Decentralization of production is another recent trend. General Mills, for example, consists of 27 principal associated companies operating in 16 states.¹⁶ Changes in freight rates have been mentioned as a cause of this decentralization, but the desire to develop new products, and to secure better market distribution of all products, old and new, and the need to make deliveries as quickly as possible and at lowest costs were the forces that induced the larger companies to seize strategic locations in every region and to cover the country with a network of manufacturing plants and distributing warehouses. One result of this expansion of plants is the very large idle capacity in the industry. It is safe to say that American mills can grind in six months the amount of flour produced normally annually.

For the larger companies, however, the milling business is highly stabilized. It produces a staple product that is a necessity whether times are good or bad. The decline in per capita consumption of flour, which at one time so alarmed the millers (a decrease from 230 pounds in 1900 to 154 pounds in 1939), seems to have reached its limit. While the price of wheat is likely to change erratically in the future as it has in the past, the millers can adjust their selling prices to the cost of raw materials and can further protect themselves by hedging in the grain markets.

The Baking Industry

Many of the Colonial flour mills also operated bakeries, a considerable part of their exports being bread, probably mainly a "hardtack" that would not deteriorate on long sea voyages. In the following period, the baking industry was split into two divisions—one producing biscuits and crackers, the other bread and pastry. The former was first to develop into the factory stage and large-scale production, since its goods were less perishable and could, therefore, be distributed over a larger area. By the 1890's the factories turning out biscuits and crackers were combining into corporations of considerable size. In 1898 the National Biscuit Company was formed by the merger of four large companies. The new company, it was claimed, would control the cracker and biscuit trade from the Atlantic to the Rockies, operating 139 plants and about 90 per cent of the total capacity of the industry. By putting its products into attractive, sanitary packages and by extensive advertising, it was able to expand its markets greatly, so that in 1900 the company was using over 2,000,000 barrels of flour annually and was

¹⁶ See Arthur Pound, *Industrial America: Its Way of Life and Work* (Boston: Little, Brown & Company, 1936), for an interesting account of this company.

preparing to mill its own flour. The National Biscuit Company disclaimed any intention to exercise monopoly control, and, in fact, did not achieve a monopoly position, for, although today it has about half of the total business in its hands, there are several large competing companies and many smaller firms with more restricted markets.

The other branch of the baking industry produces more perishable products: bread, cake, pies, and pastry. In value of output it is much more important than the older division. Bread and related products baked in 1939 were valued at \$1,198,000,000 as against biscuits and crackers valued at \$214,000,000. Since most people insist on delivery of their bread on the same day it is baked, bread baking is a local industry "The geographical distribution of bakeries is practically identical with the distribution of urban population."¹⁷ Commercial bread bakeries existed in Colonial times and all through our history. Until the First World War, however, the greater part of the population ate bread baked in the home. Conditions during the First World War turned many people from home baking. The improvement of commercial bakery products, resulting from increased mechanization and scientific processes, doubtless helped to promote their popularity. Except in the South, where there is still a pronounced demand for hot breads baked in the home, the swing was decidedly toward bakery products after 1914. In the larger cities, perhaps two-thirds of the bread consumed is now bakery bread.

This change was accompanied by a trend toward large-scale production and consolidation. True, there are still many small local bakeries. The census of 1939 listed 18,000 establishments, and this figure does not include small establishments with an annual output of less than \$5,000. With these included, there may be as many as 30,000 bakeries in the United States. But certain conditions are making large-scale production feasible. The growing urbanization of population and the improvements in roads and trucks make it possible for a single bakery to reach a larger constituency. Improved baking machinery and laboratory control of the processes make possible mass production at low costs. While technical considerations keep the optimum size of plants within rather moderate limits, combinations of large bakeries may hope to achieve further advantages, chiefly in buying flour. As a result, the decade beginning in 1900 saw a considerable number of consolidations, and a second wave followed after 1920. In the later period four large companies were formed: Continental, Ward, Purity, and General Baking. In 1926 further effort was made to combine these companies into a single giant corporation, but threatened action by the Government under

¹⁷ E. B. Alderfer and H. E. Michl, *Economics of American Industry*, p. 437. New York: McGraw-Hill Book Company, 1942.

the Anti-Trust Law, and perhaps popular outcry, caused the plan to be abandoned. However, the Ward interests are said to have large interests in Continental and in General Baking, so that these three are not entirely competitive. The growth of these companies alarmed both the small bakers and the millers. The former established a number of co-operative buying groups, hoping to be able by large purchases to obtain their flour and other materials as advantageously as the big bakers were doing. The millers were alarmed because they saw some of these big baking companies purchasing or building flour mills and also because they feared that the concentrated buying power of the large companies might force the weaker millers to sell below cost. As a result, there have been proposals that the Millers' National Federation take steps to restrain competition in sales to the big bakery companies, but the Federation has refused to consider the plan and nothing has been done.

In spite of the growth of large companies, the bread industry is a highly competitive one. Small establishments are easily set up. Every master baker is a potential entrepreneur, for not much fixed capital is required to start a small bakery. On the other hand, in such a business, margins of profit are necessarily small. The price of bread is not easily changed when costs of production increase. Wages or flour prices may rise, but the baker finds it difficult to raise the price of bread, since present prices have become sanctioned by custom as fair prices. Consequently, business failures are common and there is a considerable fluctuation in the number of baking establishments from year to year.

The Canning Industry

It has been pointed out¹⁸ that the period of the War Between the States brought prosperity to the canners. Gail Borden's first factory for manufacturing condensed milk was opened in Wassaic, New York, in 1861, and almost immediately its whole output was taken over by the National Government for army use. Soldiers acquired a taste for the product that gave it a popularity that otherwise might have taken many years to develop. Army demands also stimulated the canning of fruits and vegetables. The discovery that higher temperatures could be attained by the use of calcium chloride extended the range of fruits and vegetables that could be packed successfully and increased the dependability of the product. The growth of the industry led to the establishment of various subsidiary industries.

Machine-made cans were introduced about 1885, and thereafter the manufacture of cans became a separate industry. Machines for filling

¹⁸ See above, Chapter 10.

and sealing cans were invented. A machine for removing corn from the cob, developed about 1880, gave impetus to corn canning. Viners for picking pods from vines and shelling peas were introduced about 1893; and the "iron chink," which revolutionized the process of salmon canning, was brought in about 1903. The first developments in canning had been made in Europe, but now America took the lead in making it a machine industry.

Some progress was also made in chemical and bacteriological control in the decade of the nineties. As a result, the canneries were enabled to extend further the range of their products, because they could now can almost all food products with safety. During this period canneries were built in almost all parts of the country. Maryland was still the leading state, but California had taken second rank.

After 1900 canning grew more rapidly than any of the other food industries. Improved processes, resulting in higher-quality products and breaking down the prejudices that had deterred many from purchasing, were at the same time bringing lower costs and hence lower selling prices. The canners supervised the production of crops and furnished pure seed so as to insure a high-grade product. Scientifically determined standards of temperatures, pressure, and processing time now assure uniformity of quality for each type of food. New labor-saving machinery reduced the costs of production of raw materials.

The growing urbanization of American population also stimulated the industry. City people cannot store food and therefore cannot purchase it in large quantities. This has been the fundamental cause of the decline of home baking, canning, and preserving. Another cause of growth was the increasing number and variety of products processed. The most important addition to the list was the Hawaiian pineapple canning industry, which first became popular about 1900. The condensed soup industry should also be mentioned.¹⁹

By 1929 canning factories were operating in all but three of the 48 states. The Pacific Coast states, and especially California, were far in the lead. Withal there was a concentration on certain products in each region or state: sweet corn had made Maine important in canning; Wisconsin led in canning peas; peaches were put up largely in Maryland and California, pineapple in Hawaii, salmon in Alaska. Each has tended to be localized where soil and climatic conditions provide best and cheapest materials.

The perishability of the raw materials has also limited the size of the canneries. Doubtless the seasonal nature of the process also operates to the same effect because of the number of laborers available in any given locality. As a result, the average canning factory employs only

¹⁹ See "Campbell's Soups," *Fortune*, Vol. 12, pp. 68-76 (1935).

about 50 laborers: in fruits and vegetables, three-fifths of the canneries have an output of less than \$100,000 a year. The use of cold storage has somewhat overcome this difficulty and the recent development of quick-frozen foods may have somewhat the same effect. Necessary equipment is being leased by canners to add quick freezing to their other packing processes. As yet the frozen-food pack is small compared to that of canned foods, but it is increasing with great rapidity.²⁰

A number of canners, however, operate on a rather large scale and on a year-round basis,²¹ especially such nationally known firms as Campbell, Heinz, and Libby, McNeill & Libby. Such companies operate many plants in many states and produce a great variety of products. In certain areas, notably Alaska, California, and Hawaii, big corporations dominate canning. For example, the California Fruit Canners Association (a corporation, not an association) was organized in 1899 with a capital of \$3,500,000 to absorb the principal fruit and vegetable canneries of that state.²² Apparently it secured control of nearly three-fourths of the capacity in that state. Then, too, trade associations of canners in some states made co-operative efforts for price stabilization, securing more favorable freight rates, and co-operative advertising of products. In 1907 the National Canners Association was formed to carry on similar work on a national basis.

Nevertheless, canning is a highly competitive industry. Its chief problems arise from the fact that its supplies of raw materials may fluctuate greatly in quantity, quality, and price from year to year, so that control of production is almost impossible. Although the industry has grown faster than any other food industry, it is improbable that that rate of increase will continue. As standards of living continue to rise, it is possible that increased consumption of fresh vegetables and fruits will at least slow down the rate of increase of canning production.

The Beverage Industries

The liquor industry

The liquor industry, that is, the manufacture of alcoholic beverages, has three branches with three principal products. Most important, ranked by the value of the product, is the making of beer from malted barley; next come the distilleries, producing whiskey and other liquors from corn or rye; and third in rank are the wineries, producing wine from

²⁰ Mention should be made of the very rapid growth in the production of dehydrated food as a result of present war demands.

²¹ "Mass Production of Preserved Foods; H. J. Heinz Company," *Scientific American*, Vol. 144, pp. 258-259 (1931).

²² Now controlled by the California Packing Corporation, which operates 35 canneries, 7 plants for drying fruit, and various farms, ranches, and plantations. It employs 35,000 persons and its sales in 1937 were \$57,000,000. See Moody's *Manual of Investments: Industrial Securities*, 1937, p. 2111.

fermented grape juice. Rum and whiskey, both products of distilleries, were the popular liquors in our early national history. The rum was produced from West Indian sugar, or rather from molasses, in distilleries located mainly in New England and New York. The whiskey was manufactured in the interior, for distilleries were to be found almost anywhere that grain was grown. Wine making was a small-scale and unimportant industry up to 1860.

From 1860 to 1914 the brewing industry grew much more rapidly than distilling. Annual per capita consumption of spirituous liquors declined; that of malt liquors increased. The heavy taxes on distilled liquors had raised wholesale prices to extremely high rates, which were reflected in increased retail prices. On the other hand, the heavy German immigration had brought not only an increased demand for beer but also a supply of German brew masters who were able to improve the quality of the American product. In 1860 both brewing and distilling were widely scattered, but in certain cities they held a dominant position: St. Louis and Milwaukee, both cities with a large German population, were already noted for their breweries. Peoria was noted for its distilleries: there were 14 in that city in 1867. In Kentucky distilling was concentrating to a notable degree, and by 1890 distilleries and breweries constituted that state's most important industries. Except for some local consolidations, the brewing industry remained decentralized and spread over the country until the Prohibition era. The distilleries, however, were less widely distributed, chiefly because the heavy internal revenue duties encouraged concentration in larger establishments.²³

This concentration movement reached its peak in the formation of the Distilling and Cattle Feeding Company, otherwise known as the Whiskey Trust, in 1887. The last part of its name points to the fact that the whiskey mash, after the liquor was distilled, was sold to cattle feeders, who found it a valuable food for their livestock. The Whiskey Trust owned 85 distilleries and sold as high as 40,000,000 gallons of liquor in a single year. Financial management was faulty, efforts to set up a new distributing system incurred the hostility of the wholesalers, and the purchases of competing distilleries by the trust in order to cut down competition merely induced new competitors to enter the field. Eventually, in 1896, the organization was forced into receivership and reorganization. Various other combinations were attempted in the remaining years of the century, but no monopoly was achieved.

In the years before the passage of the Prohibition Amendment, the brewing industry was declining as to both the number of breweries and the value of output. This decline coincided with the spread of state

²³ V. S. Clark, *History of Manufactures in the United States*, Vol. II, p. 123.

Prohibition in the West and South. But the production of spirituous liquors per capita had increased, especially if allowance is made for the very large production of illegal liquor. New York and Pennsylvania led the states in brewing; Illinois and Kentucky were first in distilling; and California outranked all others in wine making.

When the Eighteenth Amendment came into operation in 1920, some 300 distilleries and 600 breweries were forced to suspend their usual operations. Some of the breweries tried to carry on by producing a "near beer" with an alcoholic content of less than one-half of one per cent. Others tried to enter different fields—the making of candy, malt syrups, cheese, chocolate, and other products. Some of the distilleries also continued operations, producing industrial alcohol and liquor for sacramental or medicinal purposes under strict Government regulation.

The chief result of Prohibition, however, was a tremendous increase in the production of illicit liquor. Thousands of people brewed their own beer, but distilled liquor, with its higher value, was the special province of the bootlegger. Thousands of illegal stills were seized, but many more escaped detection.

With the repeal of Prohibition in 1933, the liquor manufacture returned to somewhat its former status. Within a few years the number of breweries reached the total of 600 reported for 1914. Breweries are found in all the states, but 60 per cent of the beer is produced in six states. About six companies produce nearly one-sixth of the total output: three in New York or its suburbs, the other three in Milwaukee and St. Louis. The distillery industry is even more concentrated. Four states, with Kentucky leading, produce 85 per cent of the total output, and four companies produce 60 per cent.²⁴ In the case of whiskey, the producer gets only a small fraction of the selling price that the consumer pays. The largest item in the selling price is the Federal tax. Such high taxes doubtless discourage consumption to some extent, but they also serve to encourage illicit liquor production.

The "soft-drink" industry

Until the beginning of the present century, the manufacture of "soft drinks," mainly carbonated beverages, was a small-scale local industry operated by hand labor. Thereafter automatic machinery was introduced. Conveyers carried the bottles from one machine to another. New machines to wash and sterilize the bottles, to fill, cap, and label them, all operating at higher speeds than older equipment, revolution-

²⁴In distilling, the large amount of capital that must be tied up in "aging" the product makes for concentration. In brewing, improved transportation facilities have enabled the large breweries of nationally advertised brands to market their products over a larger area. They are hindered, however, by state laws requiring higher licenses from manufacturers and distributors of beer from other states. E. B. Alderfer and H. E. Michl, *Economics of American Industry*, pp. 486 and 491.

ized the industry. Mechanical refrigeration, new methods for pasteurizing the fruit juices, which allowed producers to store raw materials, and motor transportation enabled them to operate on a much larger scale and reach a much larger territory. The Prohibition era aided the larger producers by expanding per capita consumption of their products. There was a great growth in the sales of root beer, ginger ales, and other products of that type.

Most of the producers are small companies serving a limited local territory. They may have a franchise from some large company, such as Coca-Cola, from which they buy their syrups, and use the company's name for the product they sell. A small local manufacturer who has no franchise from a big national company buys his ingredients from independent manufacturers and puts his own name on the bottle. In that case, he does not have the national company's advertising and good will to help him sell his output.

With this development may be associated the increasing popularity of fruit and vegetable juices, although these are products of the canning industry. The only fruit juice commercially important before 1925 was grape juice. In 1926 canned grapefruit juice was first produced on a commercial scale. Tomato juice was introduced on a large scale in 1928. Recently "nectars" prepared from apricots, peaches, and pears have become important. Changing food habits have popularized other vegetable juices as well. They link the soft-drink industry with the canning industry and create an increasing competition for the manufacturers of alcoholic liquors.

Other Food Industries

Sugar refining

Sugar is a part of the diet of even the poorest families today. Yet it was late in the modern period before sugar was commonly used. Colonial Americans got their sugar from the West Indies, along with the molasses from which they made rum. The need for refining facilities was early apparent. In New York the Colonial Government granted a monopoly to the builder of the first sugar refinery in 1720. Thirty years later, the industry was well established in New York City, and refined sugar was being shipped to the Southern Colonies and even to Europe and the West Indies.

Growing of sugar cane was started in Louisiana before that territory became a part of the United States. At that time cane sugar was still somewhat of a luxury. In the North, many people depended on maple sugar for their supply of sweetening. In 1810 the output of maple sugar is said to have equaled that of cane sugar.²⁵

²⁵ V. S. Clark, *History of Manufactures in the United States*, Vol. I, p. 489.

By 1830 there were refineries at New Orleans and at a number of cities on the Atlantic Coast. Most of the raw sugar was imported, but a surplus of refined sugar was exported. The industry was burdened with heavy internal taxes, and its existence depended in large part on tariff protection. This took the forms, at various times, of discrimination between raw and refined sugar and drawbacks on duties. The drawbacks permitted foreign sugar to be refined in the United States without payment of duty provided the refined sugar was exported. These were at times so high as to amount to a bounty to the refiners. About 1830 they were bringing raw sugar from the East Indies and the Philippines to refine for export to Naples and Sicily.

With the development of sugar plantations in Louisiana, refineries developed also in Cincinnati, Louisville, and St. Louis. But the Atlantic Coast refineries were the most important. By 1860 the New York refiners were producing half the total supply. At that time technical improvements had cut down costs and selling prices, as a result of which the domestic consumption of sugar increased very markedly. Imports of raw sugar increased more rapidly than domestic production, which may account for New York's leadership in refining.

When the War Between the States cut off Louisiana's supply and heavy duties reduced sugar imports, efforts to produce substitutes were made. In Illinois, Ohio, and Michigan there was a rapid expansion of sorghum production. Both sugar and syrup were produced: in 1863 more than 10,000,000 gallons of sorghum syrup were sold. But at the end of the War Between the States this industry declined as rapidly as it had risen. Meanwhile, beet-sugar production, which had become a large and flourishing industry in Europe, got a start in America. A German company purchased a tract of land in Illinois for raising sugar beets and imported a German sugar mill. Other mills were erected in Iowa, Wisconsin, and California, and later similar efforts were made in the East as well. But progress was slow, particularly during the long period of declining prices from 1873 to 1897. Only in California did these early attempts bring permanent success.

Cane sugar refining capacity continued to expand, however, and presently there was considerable overcapacity. This overdevelopment caused the organization of the Sugar Trust in 1887, which was able to dominate the industry for some time. However, its success in stabilizing prices and profits tempted new producers to enter the field, so that, whereas it claimed control of 90 per cent of the refining capacity in 1893, by 1914 the figure had dropped to 40 per cent, and today it is only about 28 per cent.

After 1890 growing of cane sugar in the Continental United States remained stationary. But when Hawaii, Puerto Rico, and the Philip-

piners were brought under American domination and Cuba was bound to us by close ties, the United States gained control over an enormous cane-sugar-producing area, the largest such area in the world. Meanwhile, beet-sugar growing was also expanding. From California, where it was well established, it spread to several other states, chiefly Michigan and Colorado. A small but growing market for the waste products of the beet-sugar mills as stock food helped materially. Improved-quality beets gave more sugar which could be more easily and economically extracted. By 1914 beet-sugar production was over twice as great as cane-sugar production in Continental United States.

By 1914 there were 18 sugar refineries. The largest were in Boston, New York, and Philadelphia; there were several on the Gulf Coast and others in California. The American Sugar Refining Company still dominated the industry, although its control was interrupted periodically by warlike attacks of aggressive rivals. The Trust doubtless brought some advantages to the industry, chiefly in the adoption of technical improvements and business economies. But evidence at Government hearings "records a long tale of overcapitalization, exorbitant promotion, profits that became a permanent burden on consumers, railway rebates and other unfair commercial practices, and even admitted frauds against the government."²⁶

The First World War created a temporary boom in sugar growing in the United States and its dependencies, since European sugar-beet growing declined greatly and other surplus areas could not obtain the necessary transport. The Government obtained control over the Cuban sugar-cane crop. By 1920 the price of sugar rose to 22 cents a pound. When the recovery of beet-sugar production in Europe caused prices to fall, our Government tried to protect American sugar producers by raising the tariff duties in 1926 and 1930. In spite of this measure, domestic sugar production declined. Imports of cane sugar from our insular possessions increased, for they were better able to meet low-price competition.

To meet this situation, Congress in 1934 established a quota for each group of producers, the domestic producers being induced to observe the quota set for them by a benefit payment paid from the proceeds of an excise tax imposed on domestic refiners. In practice this seems to have worked to the benefit of the beet-sugar interests and the insular cane producers but not the domestic refiners.²⁷ The sugar imported from the West Indies has in increasing proportion been refined sugar rather than raw. This growth has taken place at the expense of the domestic

²⁶ V. S. Clark, *History of Manufactures in the United States*, Vol. III, p. 274.

²⁷ J. E. Dalton, *Sugar, A Case Study of Government Control*, Chap. 15. New York: The Macmillan Company, 1937.

refiners. The latter have no protection under the quota law except a provision limiting the imports of refined sugar from the offshore refineries to 612,000 tons a year.

From 1900 to 1925 per capita consumption of sugar increased rapidly. Since that time it has remained stationary. Roughly three-fourths of this is cane sugar, and the balance beet sugar.²⁸ Since no great increase in population is probable in the near future and per capita consumption is no longer expanding, it would seem that the market for sugar has reached a point of relatively fixed demand. With large areas, particularly in our insular dependencies, available for expansion of production, much depends on the course of Government action. Government control of supply seems to be necessary in order to achieve reasonably stable conditions.

Candy manufacture

Candy of some sort has been made for centuries, but candy manufacture had hardly moved out of the household production stage before the beginning of the present century. At that time soft candies were being made in small shops, "candy kitchens," as they were called, by hand labor on a small scale for a local trade. Hard candies, being less perishable and more easily transported, were made in small factories with at least some power equipment. After 1900 candy consumption increased rapidly. It showed an especially rapid growth during the Prohibition era. Consumers had more dollars available for candy, and liquor users found candy a substitute stimulant. After Repeal the growth continued, being stimulated by heavy advertising. The sale of five- and ten-cent candy bars found many new outlets for candy: drug stores, restaurants, cigar stores, refreshment stands, and vending machines all added to the selling force and doubtless helped to increase the sale of candy. The cigarette manufacturers tried indiscreetly to induce smokers to "reach for a Lucky instead of a sweet," but candy sales to smokers did not fall off materially. Instead the National Confectioner's Association was provoked to a retaliatory publicity campaign.

Most candy manufacture is still a small-scale industry, with plants located close to their markets. Every town of any size has its candy factory. Production is still mainly by hand labor, much of it unskilled, inexperienced, and underpaid. Labor conditions have often been unfavorable. Nevertheless, there is some evidence of concentration and large-scale production. The number of large firms tends to increase, and

²⁸ But note that in sugar production in the Continental United States the proportions are reversed. Under the quota domestic beet sugar producers may furnish 23.19 per cent of the total, Continental cane-sugar producers only 6.29 per cent of the total. The remaining 70.52 per cent is to come from Hawaii, Puerto Rico, the Philippines, and Cuba mainly.

mergers and consolidations occur. In some cases, firms producing other food products are entering the confectionery field to round out their lines. Grocery and restaurant chains are also establishing plants of considerable size to supply their own customers. Increasing mechanization and standardization of products are especially apparent in hard candies.

Dairy products

The increase in the number of dairy cows provides a simple measure of the growth of the dairy industry. In 1860 there were some 8,000,000, by 1920 there were over 19,000,000, and by 1939 over 25,000,000 dairy cows in the United States. Up to 1860 dairying had made but little progress in getting away from century-old methods. After that date change began. Cheese factories began to multiply; creameries and condensed-milk plants got under way. The development of the refrigerator car by the meat packers aided dairying also by providing efficient transportation to distant markets. State associations were established by the dairymen for the improvement of the industry, first in Vermont (1869) and then in the seventies in New York, Illinois, Wisconsin, and Minnesota. In 1870 *Hoard's Dairyman* was established in Wisconsin. From the first it exerted a powerful influence for the progress of the industry.

The westward expansion of dairying brought it into territory that had carried on staple wheat growing until soil exhaustion, insect pests, and the competition of newer lands farther west made wheat growing a losing venture. The shift to dairying was often difficult, since it required considerable capital and great agricultural skill. But by 1920 that change-over had been completed in Wisconsin.²⁹ Whereas in 1860 New York led all the states in the number of cows, by 1920 Wisconsin was first.

Since 1890 milk production has been aided by a number of important developments: the cream separator, invented in Sweden in 1877 and brought to America soon after; the introduction of the silo, also from Sweden (1882); the invention of the milking machine; and the development of pasteurization. The separator and the milking machine are labor-saving devices. Mechanized milking also prevents contamination and deterioration of the product, as also does pasteurization. The milk test enables the farmer to discover the profitable and unprofitable members of his herd and thus to eliminate the latter. By 1931, there were only 15 per cent more cows in the United States than there were in 1914, but the increase in milk production was over 50 per cent.

²⁹ For the beginnings of dairying in Wisconsin see F. Merk, *Economic History of Wisconsin During the Civil War Decade*, pp. 22-30. Madison: The State Historical Society of Wisconsin, 1916.

The dairy industry has two main branches (or three, if the raising of animals for breeding purposes is included): the production of milk for direct consumption (fluid milk), which absorbs nearly half of the total output; and the milk that is to be processed before being sold to the consumer. Butter making takes about 36 per cent of the total milk output, and cheese, ice cream, condensed milk, and other products take 3 or 4 per cent, leaving 6 or 7 per cent to be used on the farm.³⁰

Milk for direct consumption is usually sold to city distributors, by whom it is pasteurized, bottled, and delivered to domestic and other users. Because the distributors are small in number and strong financially, and since mechanization and large-scale operations require large capital, the milk producers have been forced in many instances to organize themselves co-operatively in order to bargain successfully. By 1935 fully 20 per cent of the fluid milk was sold through such associations.

Whereas production of fluid milk is necessarily concentrated near the great consuming markets, the manufacture of butter and cheese is much more decentralized. Butter and cheese can be stored for considerable periods and shipped long distances to market. Their manufacture, therefore, can be carried on in regions where conditions are most favorable. Wisconsin and Minnesota seem at present to be the most favorable regions. In those states butter and cheese are manufactured in thousands of local creameries scattered over the countryside so that the skimmed milk, buttermilk, and whey may be returned to the farmers to feed their calves and pigs.

It has been pointed out³¹ that the first cheese factories were started in Oneida County, New York, in 1850. Ten years later the first creamery was started in the same state. From New York the idea spread into other dairy states. Descendants of English dairymen moved from New York to Wisconsin and there introduced the art of making Cheddar cheese. Swiss immigrants popularized the making of Swiss cheese. In another 10 years Wisconsin cheese was winning prizes in competition with that of older states. In Minnesota creameries developed more rapidly than cheese factories. Many of these were of the co-operative type. Historically, it was the dairy farmers who were the first to set up co-operative associations in the United States. In 1934-1935, 35 per cent of the butter produced in this country and 21 per cent of the cheese was marketed by co-operative associations. The creamery co-operatives were especially strong in Minnesota. In 1924 a group of them organized the Land O'Lakes Creameries, Inc., which may serve as a type of a number of large federated marketing co-operatives. This group is

³⁰ The estimations are for 1926. See *Biennial Census of Manufactures*, 1927,

³¹ See above, p. 207.

now composed of some 400 local co-operative creamery associations in Minnesota, Wisconsin, and North and South Dakota. Prior to 1924 each of these associations had been marketing its output independently through commission merchants, butter wholesalers, or chain-store organizations. Land O'Lakes now undertook to perform these marketing functions. It set up sales offices, approached new buyers, and advertised the products of the associated creameries under the Land O'Lakes brand. In order to assure the quality of its products, it secured Government inspection and paid premiums for top-quality butter. Only the best-quality butter was allowed to use the Land O'Lakes name. As a result of the Land O'Lakes activities, the local creameries are getting better prices for their butter and are thus enabled to pay better prices to the farmer for his milk and cream.

Land O'Lakes has not stopped there. To utilize its shipping facilities fully and to help the local associations and their members, it sells eggs and poultry. And to use surplus milk it has gone into the manufacture of cheese and powdered milk, ice cream, and casein. Obviously, the more outlets that can be found for the surplus milk, the easier it will be to secure for the farmers a fair price for the fluid milk.

Naturally, not all the creameries and cheese factories are co-operatives. The Chicago meat packers own chains of them, and there are a number of other chains operated by stock companies. But the co-operative is the dominant form of organization in this branch of dairy production. In contrast, the production of condensed, evaporated, and powdered milk is a field in which the co-operatives have had little success as yet, except where large co-operative milk-producers associations have entered the field to find an outlet for their surplus fluid milk. In the production of canned milk, as well as in ice cream manufacture, increased mechanization, the need for large capital, and the advantages of quantity production have permitted private proprietorship corporations to take the lead.

It would seem that, for the future, co-operative associations should make a greater effort to increase American consumption of dairy products. The United States now ranks only sixth in per capita consumption of milk, although consumption is increasing markedly. We rank no better than ninth in the consumption of cheese. Butter is relatively more popular than cheese in America; but when the price of butter rises, the substitution of oleomargarine increases. Our dairy industry may lead the world in efficiency, as it is claimed; but when the per capita milk consumption is only half the minimum considered necessary by experts to maintain the highest level of public health, it would seem that the biggest job left for the co-operative associations in dairying is to promote by every possible means the expansion of the market. This, rather than restriction of output, should be the long-term goal.

Other Agricultural Processing Industries: Leather and Tobacco

Leather

After the War Between the States, the growth of the packing industry in Chicago created a large new source of raw materials for the tanneries. Slaughtering of animals meant that a vast number of hides had to be disposed of. North of Chicago were hemlock forests. These advantages drew Eastern tanners into the area and new tanneries were built in Michigan, Wisconsin, and Illinois. Milwaukee, which had begun tanning before the War Between the States, now became one of the leading centers of the industry.

These new tanneries were large-scale enterprises, calling for improvements in tanning methods. One such improvement was the decision to manufacture tannin extracts at the source of the bark supplies. This plan saved the waste of bark in shipment, cut down freight charges, and eliminated labor and storage space where they were usually most expensive: at the tannery. Moreover, the use of extract instead of bark gave more exact results and saved time in the production of leather. Different extracts could be blended to obtain any desired tanning mixture, which was a large step in the direction of the scientific control of processes. This development also released the tanneries from bondage to the bark supplies. They could now be located where supplies of hides or favorable market conditions dictated. Tanning extracts could also be obtained from foreign countries. The tanneries began to locate their plants close to the packing houses so as to dispense with drying, salting, or pickling the hides as a preparation for transportation.

Another development was the introduction of tanning methods employing metallic salts such as chromium. Earlier efforts to use this method had produced a leather so hard and brittle that it was valueless, but in 1888 a Philadelphia tanner produced a chrome leather, which he called "Vici kid," that overcame this difficulty and quickly became popular. Other tanners made haste to adopt the process for lightweight leathers made from goat skins or lightweight calf skins, so that presently 90 per cent of all upper leather for shoes was chrome-tanned.

The tanning industry had also shown increasing concentration of ownership and management. Thousands of small country tanneries (or "tub" tanneries) were unable or unwilling to adopt the new methods and processes and were driven out of the business. Coincident was a process of mergers and consolidations of plants that were favorably disposed to unite. In 1893 the United States Leather Company was formed

to combine the principal tanneries making sole leather. The six companies merged were said to control 150 establishments. Later the combination acquired additional tanneries in the Middle West and extensive bark lands in Wisconsin. At the same time inefficient plants were scrapped and production was transferred to better-equipped and better-located ones. By 1929 the company was operating 86 tanneries in 10 states. It owned timber lands and extract works, sawmills, glue factories, and wood-working shops. Heavy leather was its principal product; it turned out one-third of the American production. Ten years later, however, it was operating only 16 tanneries and producing one-fifth of the total output. Still the strongest organization in the field, the company was meeting stiff competition.

In light leather there was a similar combination, called the American Hide and Leather Company and formed in 1899 by a merger of 23 companies which at that time produced three-fourths of the upper leather tanned in the United States. Its capital was only \$35,000,000 (as compared with \$80,000,000 for the United States Leather Company), for chrome tanning required no heavy investment in timber lands and relatively little in leather in process of manufacture. By 1929 this company owned 20 tanneries, 13 of them in Boston. Like the United States Leather Company, it carried out a plan of dismantling smaller, less efficient plants and concentrated operations in larger and better-equipped ones. Similarly, it lost its original domination over this branch of the industry, until currently it controls only about 15 per cent of the calf-leather output and even a lesser proportion of other light leathers.

The tanning industry, both the heavy- and light-leather branches, has encountered a new source of competition. Rivals have come both from the producers of hides and from the manufacturers of leather. About 1890 the Chicago packers, Armour and Swift, entered this field, and, in 1899 Endicott-Johnson, one of the largest American shoe manufacturers, did the same, an example shortly followed by several other shoe manufacturers. The shoe manufacturers and the packers together have taken perhaps 30 per cent of the business away from the other tanners. In addition, they face a loss of trade through the competition of substitutes, such as composition soles and heels for shoes, the falling off in the demand for harness leather and belting, and the change from leather to cloth upholstery in automobiles.³² For many years there has been little progress in technology, for the tanners have not emphasized research. Their unsatisfactory outlook may force them to pay more attention to the possibilities of chemical research and thus bring progress to the industry.

³² See E. B. Alderfer and H. E. Michl, *Economics of American Industry*, pp. 390-395, for a fuller discussion.

Tobacco manufacture

The War Between the States encouraged Northern tobacco manufacture, especially in New York, but Richmond recovered the place of leadership as soon as the war was over. Perhaps the most important development in that decade was the introduction of the cigarette. Cigar making remained a small-scale, hand-labor, widely dispersed industry until after 1900. The first cigarettes were also handmade, but soon after 1880 machines were developed and the processes of cigarette making became mechanized and standardized. This development resulted in the familiar round of large-scale production, cutthroat competition, and combination. In 1890 the five principal producers of cigarettes united to form the American Tobacco Company. Within a few years of hard fighting it managed to achieve a monopoly control of cigarette manufacture. At the same time it extended its activities into the plug and smoking tobacco fields. The manufacture of snuff and cigars was subjected to at least partial control, and the company even entered the retail field by means of the chain of United Cigar Stores, which it controlled.

Meantime there came an increasing mechanization of the smoking and plug tobacco field that accelerated large-scale production. The Trust was able to close out smaller plants, erect larger and more efficient ones, and thus adopt modern manufacturing economies. The American Tobacco Company also attempted to extend its control over foreign fields as well, building or acquiring cigarette factories in Canada, Australia, Japan, Mexico, and Germany. Havana cigar factories were taken over and Great Britain was invaded, "where a long struggle ended in a compromise with the British producers and the creation of what was virtually an international tobacco trust."³³

By 1907 the American Tobacco Company controlled 75 per cent of the American trade in cigarettes, chewing and smoking tobacco, and snuff, and about 25 per cent of the cigar industry. That control had been built up "with brutal energy upon ruthless competition and unfair practices,"³⁴ but it is also true that no other industry had developed an organization so complete and so efficient.

During this time important changes in the geographical distribution of the industry had taken place. In 1890 Richmond was still an important manufacturing center. St. Louis, Louisville, and Cincinnati had become important in the manufacture of plug tobacco. New York City was the first important cigarette-manufacturing city, but after 1890 Durham and Winston, North Carolina, together with Richmond, became the chief centers for that branch of the industry.

³³ J. W. Jenkins, *James B. Duke, Master Builder* (New York: Geo. H. Doran Company, 1927), describes this interestingly.

³⁴ V. S. Clark, *History of Manufactures in the United States*, Vol. III, p. 280.

The consumption of tobacco increased gradually after the War Between the States. Whereas in 1863 only 1.6 pounds per capita was consumed, by 1935 we were using over 6 pounds per person, a consumption higher than that of any other country. Much of this increase was due to the remarkable popularity of the cigarette, beginning with the introduction of the blended cigarette just before the First World War and its popularization by the Tobacco Trust and its successor companies.

The American Tobacco Company had been brought into court in 1911 and the Supreme Court had ordered its dissolution. Some 14 separate companies were formed, with an arrangement that provided for at least two companies in each of the branches of tobacco manufacture. In the cigarette field it was these new companies that brought out the new type of cigarette, on which they concentrated their promotional efforts. Large-scale production in highly mechanized plants, the exercise in the tobacco markets of their superior buying strength, which allowed them to purchase raw materials at low prices, and, above all, a tremendous campaign of advertising to increase the consumption of the cigarettes, particularly among women—those were the causes of the rapid expansion of cigarette production. Today cigarettes constitute three-fourths of the total product-value of the industry. Competition has undoubtedly been restored to this branch of the industry—not, it is true, in prices, but rather in the form of elaborate advertising to convince the public of the superiority of each competitor's product. Moreover, new companies have come into the field, some of them selling at prices materially lower than those charged by the big companies. These manufacturers of the "10-cent brands" are now getting a material share of the trade, although the three largest companies still produce two-thirds of the entire output.

Cigars, as has been said, were made by hand until about 1919 when the American Tobacco Company (one of the concerns arising out of the dissolution of the Trust) began to produce machine-made cigars. The demand for the more expensive brands fell off: only the five-cent cigar could compete against the increasingly popular cigarette. In spite of strenuous advertising, the cigar industry lost ground from 1919 to 1929; since then its production has barely held its own. It is not likely to make further progress as long as the cigarette holds its present popularity.

At the present time cigarettes make up about 75 per cent of the value of products manufactured from tobacco, cigars, smoking tobacco, chewing tobacco, snuff, and other products the balance. The "other products" are such products as sheep wash and plant fumigators, which are made out of the refuse and waste of the plants.³⁵

³⁵ Alderfer and Michl, *Economics of American Industry*, p. 494.

Some Effects and Tendencies

The industries discussed are collectively the most important group of American manufactures. The food, liquor, and tobacco group is the leader of the four largest industrial groups: in value of product and in value added by manufacture, it outranks the textile industries, iron and steel, and motor vehicles. Not only are the food industries large, but they are growing, owing to a wide variety of factors. Population growth has enlarged markets for all. The shift of population to the large cities has also moved some of these industries from the home to the factory: baking, canning, and dairy products, for example. The increasing employment of women in industry has operated toward the same effect. A higher standard of living for the masses has enabled them to add variety to their diet. Changes in living conditions, such as less strenuous manual labor, better-heated houses, closed automobiles, and so forth, have enabled us to cut down our consumption of certain foods. The flour mill and the bakery have suffered from a decrease in per capita consumption of their products, and so has the packing house; but the consumption of milk and milk products has increased. The demand for a greater variety in diet has benefited the canning industry to no small extent.

While the industries discussed all show a tendency toward increased mechanization and large-scale production, most of them are carried on in both large-scale and small-scale establishments. Especially is this true for canning, in which the perishability of the raw materials is a dominant factor. It is not so true in tanning, packing, and sugar refining, where large capital is needed to carry large inventories, to process by-products, and to provide complicated and expensive machinery.

Note again the tendency toward consolidation and concentration of control in these industries. The savings in cost of distribution resulting from consolidation, the savings in overhead expense when allied lines are entered, and the ability to develop new processes and new products have all promoted this development. The growth of large-scale retailing has had a similar effect on those manufacturers producing consumer goods.

Since the raw materials of these industries all spring from agriculture, there are necessarily wide fluctuations in supply and price. This variable factor creates a degree of instability. In most cases, the consumer demand for their products is elastic, and the retailers cannot readily adjust their prices to the changes in the prices of the raw material. In flour milling, the producers can protect themselves from these fluctuations by the process of hedging, but for the others this method is not available. On the other hand, in most of these industries, the demand is

much more stable than the supply, a fact that favors stability in earnings.

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CHAPTER 21

The Heavy Industries Since 1860

INDUSTRIALISM CAME OF AGE in the post-war decades, and the heavy industries laid the foundations for the new economic structure.¹ Peripheral in their position and importance in the agricultural economy of the earlier years the heavy industries occupied a position of central importance in an economy resting solidly on iron and coal. The capital equipment of our industry assumed a scale, complexity, and cost in comparison with which that of the period before 1850 has the appearance of small-scale working models. In the new industrial technology man was changed from a direct manipulator of materials and tools to a pusher of buttons, reader of dials, and puller of levers controlling giant mechanisms, a metamorphosis that proceeded fastest and furthest in those branches of manufacture concerned with the production of metals and heavy equipment.² This is the period when blast furnaces were raised 100 feet in the air, making pygmies of the men who served them; of trains of rolls extending hundreds of yards and capable of reducing in a single operation an eight-ton ingot to a ribbon of sheet steel several feet wide and many hundreds long; of cranes powerful enough to carry the heaviest locomotives; of ore-handling equipment that emptied freight cars by turning them upside down.

In organization as in equipment the heavy industries did much to introduce the age of giantism. If the trust was conceived in oil, it came of age in U. S. Steel and Anaconda Copper; although bituminous coal resisted the consolidation in wide sectors, in the anthracite field there early developed one of the most compact and powerful monopolies the country has known. Concentration of ownership and control, far from universal, was peculiarly characteristic of this field of enterprise. The heavy industries, dispelling the haze of anonymity that clouded industrial growth of the earlier years, contributed their full share of colorful personalities to the new age of big business: Carnegie and Schwab in steel; Daly, Heinze, and Guggenheim in copper; Frick in

¹ For the period covered by this chapter there is a dearth of specialized literature dealing with the history of particular industries. The standard general work on manufacturing for this as for the earlier period is V. S. Clark, *History of Manufactures in the United States* (1929 ed.), Vol. 2 (1860-1893); Vol. 3 (1893-1928). Washington, D. C.: Carnegie Institution, 1929.

² For a stimulating discussion of the implications of electricity for the industrial age ahead, see Walter N. Polakov, *The Power Age: Its Quest and Challenge*. New York: Covici, Friede, Inc., 1933.

coal and coke; Merritt and Oliver in iron ore. Led by men of bold imagination, organizing genius, and, very often, buccaneering morals, equipped and directed by engineers and technicians who achieved remarkable results in mass manipulation and processing of materials, favored by natural resources of extraordinary extent and richness, sustained by an ever-replenished supply of cheap immigrant labor and by tariffs protecting the weakest and least efficient companies from foreign competition and enabling the sounder and better-managed to reap profits that at times were literally fabulous, the heavy industries in the generation following the War Between the States laid solidly the foundations for the development that by the turn of the century had made the United States in many respects the leading industrial nation of the world.

The Age of Steel

The new industrial age was, above all, an age of iron and steel. The main emphasis in this, as in the earlier period, necessarily falls on the keystone of the whole structure of industry, for although the gap between the ferrous and other heavy industries narrowed appreciably as nonferrous enterprises spurted forward under the stimulus of new and extraordinary demands, iron and steel continued to dominate the scene. The major demand for iron continued for some years to come from the railroads, but important new commodities were pushing to the fore, especially structural iron for the new age of skyscrapers, pipes and tubes to serve as the arteries of industry, armor plate for an expanding navy, and, later, vast quantities of sheet metal to supply the mushroom growth of the automobile industry. Merchant bar, once the chief product of the rolling mills, was reduced, so far as traditional sizes and shapes were concerned, to a position of very minor importance.

Technical advances in this period were many and varied, but without question those of most far-reaching significance were those associated with the Bessemer and open-hearth processes of making steel.³ Despite certain misleading connotations of the phrase, the "age of iron" truly became the "age of steel," and the whole economy felt the impact of the change. It is important at the outset to avoid the misconception that this new kind of mass-produced steel resembled at all closely the kind of steel used traditionally in cutlery and edge tools and heretofore manufactured with much difficulty and at high cost. Bessemer and open-hearth steel fell midway in chemical composition and qualities between wrought iron and tool steel, lacking the softness and weldability of the one and the hardness and brittle quality of the other. The new steel

³ Fuller accounts of the technical aspects of the making of iron and steel may be consulted in Waldemar Kaempfert, *A Popular History of American Invention* (New York: Charles Scribner's Sons, 1924) and H. M. Howe, *The Metallurgy of Steel* (New York: The Engineering and Mining Journal, 1904).

was a low-carbon steel, soft as steels go but having a much greater tensile strength and hardness than the wrought iron that had been the staple product of the puddling furnaces and rolling mills. Admirably suited to a country-blacksmith, horse-and-wagon age, wrought iron for all its toughness was lacking in the qualities demanded to withstand the high speeds, heavy strains, and punishing treatment of the age ahead. Moreover, with the new methods steel could be produced on a large scale quickly and at low cost, not only far more cheaply than edge and tool steel but before very long more cheaply than the wrought iron that it was so largely to supplant.

The Bessemer process

The Bessemer and open-hearth processes were methods of refining the product of the blast furnace, using molten pig iron in the beginning and later the hot metal taken directly or by way of a mixer from the blast furnace. The refined product in each case was given the character of steel by the addition of carefully measured amounts of carbon in some form; it was then cast into ingots preliminary to reduction in the rolling mill to the proper size and shape. The Bessemer or pneumatic process was the more radical and spectacular of the two processes, and the first of them to be introduced in this country. The charge of metal, weighing from 3 to 20 tons, was poured into the familiar eggshaped converter and a blast of air was blown through it from the bottom. In the resulting combustion not only were the carbon, silicon, and other elements associated with the metal removed, but their oxidation supplied the heat necessary for the refining process. Sir Henry Bessemer was not only responsible for the central idea of the process but he designed elaborate equipment and hydraulic machinery that contributed much to the practical success of the new method. The introduction of the process in this country was delayed for a time by a controversy growing out of conflicting patents of Bessemer and William Kelly, an American who had devised and patented without developing to the point of practical success a pneumatic method of refining iron.⁴

The open-hearth process

A major limitation of the Bessemer process was its failure to remove two elements having a deleterious effect upon the refined product: phosphorus, in particular, and sulphur. The process was consequently limited to refining pig metal made from the so-called Bessemer, that is, free of

⁴ The fact that Kelly was an American is evidently the principal reason why certain popular writers have made much of an invention that, had not Bessemer developed his process, would never have attracted notice. Kelly's patent proved very useful to industrial interests in this country as a bargaining weapon in negotiations with the Bessemer group for the exchange of patent rights.

phosphorus, ores that comprised but a part of the ore reserves of this country. The problem of refining non-Bessemer pig iron cheaply was solved by the introduction of the open-hearth process, which, like that of Bessemer, was developed first abroad. In this process, scrap iron and steel were charged with pig metal into a reverberatory furnace of a type not unlike the old puddling furnace. The metal was reduced to a molten state and kept so without physical manipulation until the impurities had been removed through various chemical reactions. The lining of the furnace was composed of a basic material that combined with the phosphorus, removing it and other impurities, with the slag. Although the open-hearth process was slower than the Bessemer process—and for many years more expensive—that slowness permitted testing the metal at various stages, and much closer control over the characteristics of the final product. Another advantage of great importance for the future was the possibility of using scrap metal as part of the charge, thus providing an important outlet for materials otherwise difficult to utilize. Moreover, while the open-hearth process could be carried on with much smaller units and less equipment than the Bessemer process, furnace capacity was steadily increased until the handling of 250 tons per heat was possible.

Although made experimentally in this country as early as 1864, Bessemer steel was not produced commercially until several years later when several plants were established in the East and Middle West. The principal use to which Bessemer steel was put in the early years was in rails, where its superior wearing power was soon demonstrated. Despite their much greater cost Bessemer rails were adopted rapidly, particularly for main-line use where traffic was heavy. Of nearly 900,000 tons of Bessemer steel made in 1880 741,475 tons were rails. Five years later, iron rails accounted for only 15,000 tons of a total of something over 1,000,000 tons. Nearly three-fourths of the Bessemer product in 1885 went into rails, but as steel proved itself in use and as methods of manufacture and control of quality and characteristics improved, the factor of cost turned in favor of steel. Wrought iron was confined to an ever-narrowing range of uses, although for some purposes it continued to be superior.⁵ Efforts made to reduce the cost and enlarge the scale of wrought iron production by mechanizing the puddling process were not particularly successful and the methods devised for this purpose were not widely introduced. Open-hearth steel gained steadily in favor, attaining preference first in the manufacture of sheet and plate steel and steel castings and eventually entering the rail field. By 1908 its pro-

⁵ The greater resistance of wrought iron to corrosion, for example, makes it preferable for certain products such as pipe when used under certain conditions or for certain purposes.

duction topped that of Bessemer steel and thereafter advanced with such rapidity that by 1930 the ratio of open-hearth steel to Bessemer was seven to one.

New and cheaper ores

While this revolution in the refining of iron was under way, equally significant advances were being made on the quantitative side in the mining and handling of ores and in blast furnace operations. The post-war decades witnessed a notable expansion of production in the Lake Superior ore fields, marked especially by the rise to prominence of the rich Mesabi ranges and the thoroughgoing mechanization of the handling of ore from mine to furnace-mouth.⁶ The Michigan and Wisconsin mines, which produced practically all the Superior ores in use prior to 1890, were hard and rocklike in character and had to be mined by drilling and blasting. After the first few years operations were almost entirely underground. The Mesabi ores of Minnesota, on the other hand, were soft and crumbly and lent themselves admirably to the stripping and steam-shovel techniques of mining. Tracks were laid in the open pits and railroad cars loaded at the excavation. These advantages more than offset the greater distance from the Mesabi field to the major lake ports of delivery. Once the technical difficulties of handling this dustlike ore had been overcome, its use increased rapidly, and by 1913 70 per cent of the 50,000,000 tons of ore mined in the Lake Superior district (out of a total of some 62,000,000 tons for the entire country) came from the Mesabi field. Improvements in ore-handling facilities made it possible to unload 10,000 tons from specially designed ore freighters in less than two hours and loading from gravity docks was effected with equal rapidity. The freight charges on Lake Superior ores to Cleveland and Buffalo were reduced even before the First World War to one dollar and less a ton.

A new and important source of ores in the last quarter of the century was the Alabama-Tennessee district centering in Birmingham. Despite their unsuitability for Bessemer purposes, their proximity to cheap coal and their usefulness for foundry iron encouraged their active development, and by 1892 they constituted nearly one-fourth of all the ore raised in the country. Eastern ores still played an important, if minor, part in the industry and ores in steadily increasing quantities were brought from Spain, Cuba, and elsewhere for use in the furnaces of the interior as well as along the Seaboard.

⁶ The best account of the Superior ore fields on the historical as well as the organizational side is H. R. Mussey, *Combination in the Mining Industry: A Study of Concentration in Lake Superior Iron Ore Production* (New York: Columbia University Press, 1905). For the Mesabi field, see F. P. Wirth, *The Discovery and Exploitation of the Minnesota Iron Lands* (Cedar Rapids, Iowa: Torch Press, 1937).

Bigger and better blast furnaces

In the blast-furnace department changes of equal magnitude were taking place. The old square masonry structure, which in ruin took on so picturesque a character, built against a hillside to facilitate hand charging by wheelbarrow at the tunnel head, began to be replaced in the sixties by cylindrical boiler-plate shells lined on the inside with refractory brick and elevated on supporting pillars for convenience of access. Within a few years automatic skip hoists carried charges to the top and emptied them, completing the mechanization of operations. Hot-blast stoves were removed from the tunnel head and placed in a row upon the ground near by. Using gases piped from the tunnel head, these immense stoves under the improved regenerative technique made possible air-blast temperatures of twice the 600° (F.) reached by the older method. Higher temperatures and increased pressure supplied by powerful blowing engines greatly accelerated the smelting process and, combined with the use of larger furnaces, raised production to phenomenal figures. The lead was taken by the Pittsburgh district and by the Carnegie works where rivalry fostered by Carnegie brought extraordinary results. Whereas before the War Between the States few furnaces reached an output of 300 tons a week and 50 to 100 tons were good average yields, and whereas in the seventies 600 tons was the maximum, by 1880 there were furnaces at Pittsburgh turning out 1,200 tons a week. Ten years later this figure was doubled and in 1905 a pre-war record of 918 tons a day was set by a furnace at the Edgar Thomson works. Average furnace output increased sixfold between 1874 and 1892. British ironmasters were amazed at these achievements.

Rolling mill practice

Developments in the rolling mill were no less extraordinary. The typical practice in the merchant-bar and early rail mills was to pass the slabs and bars through the rolls by hand and then carry them back to repeat the process from the same side as many times as might be necessary. Such methods were hardly practical for handling the rails of increasingly heavy section and the structural shapes that were demanded by new industrial requirements. The three-high mill, introduced in the late fifties and permitting the bar to be passed back and forth without waste motion or handling, was the first of an important series of innovations that eventually eliminated, save for the hand at the controls, human muscle. Mechanical devices pushed the ingot from the furnace or raised it from the soaking pit on to the roll tables, passed it back and forth through the rolls, turned it over when necessary and carried it to the shears or trimming saw at the completion of the process. The peak of achievement in rolling came

with the introduction in the twenties of the continuous strip mill in which a succession of rolls in a few minutes transformed a heavy ingot into a long, thin strip of sheet steel that was wound, in turn, into a thick, tight coil convenient for handling and storage.

Of the newer products of the rolling mill, none was more exacting in its requirements than the structural shapes that were acquiring such importance. Prior to the decade ending 1860, most of the iron made for structural purposes took the form of cast-iron girders and pillars. The earliest demand for structural iron and steel came from the railroad bridges needed to sustain the loads of increasingly heavy locomotives and rolling stock. When in the last decade of the century mounting land values and the concentration of business in the larger metropolitan centers brought in the age of the skyscraper, structural steel received a new impetus that was greatly to expand this branch of production and to take up some of the relative slack resulting from the completion of our railway network and the stabilization of rail demand.

The total output of rolled products, which in the *ante bellum* years had just passed 500,000 tons, reached an annual average of more than 5,000,000 tons in the late eighties, rose to 16,000,000 in the years 1900-1910, 32,000,000 by 1920, and a peak figure of 41,000,000 tons in the boom year of 1929.⁷ Indicative of the developing requirements of the new industrial age was the course of production figures for the major products of the rolling mill. Rails reached a peak annual average of 3,250,000 tons from 1906 to 1910 and thereafter leveled off at about 2,750,000. Structural shapes, which in the early nineties averaged less than 500,000 tons, overtook and passed rails in the period from 1911 to 1915 and advanced to a peak of nearly 5,000,000 tons in 1929. Plates and sheets, starting from an average annual figure of less than 700,000 tons in the late eighties, mounted steadily to more than 8,000,000 tons between 1916 and 1920, slumped for a few years, and rose to 12,500,000 tons in 1929. While the growth of the automobile industry was the most important single factor in the development of this class of rolled products, the extraordinary expansion of production indicated by these figures reflected the replacement of wood by sheet steel not only for innumerable industrial uses but also in a wide variety of consumers' goods ranging from filing cases and refrigerators to children's toys.

The geography of iron and steel

The geographical distribution of the industry, in the meantime, underwent important changes. Although the erection of new and enlarged

⁷ The annual *Statistical Abstract of the United States*, compiled under the direction of the Bureau of the Census, contains a wealth of statistical data on our industrial growth, frequently going back as far as 1850.

plants along the Seaboard more than counterbalanced the decline of the old charcoal industry of the East, and although Pennsylvania continued to lead all other states by a wide margin with the Pittsburgh district maintaining its position, there was a westward trend among the establishments of larger scale. A preference was shown for shore sites on the Great Lakes with convenient access to ore supplies. This trend was demonstrated by the transfer of the 60-year-old Lackawanna works from Scranton to a site near Buffalo where a \$40,000,000 plant was erected at the turn of the century, and by the United States Steel Corporation's establishment of a \$50,000,000 plant on Lake Michigan in Gary, Ind. The Chicago district showed the most substantial growth in the period between 1865 and 1914. Some of the first Bessemer steel in the country was made and rolled there and a thriving blast-furnace industry based on Superior ores and Connellsville and Illinois coal developed in the seventies and eighties. A single company owning works in both Chicago and Milwaukee increased its production from 60,000 tons in 1875 to more than 1,000,000 tons in 1888, and formed the nucleus of an organization that 10 years later was to rival the largest steel enterprise of the Pittsburgh district. The early hopes of St. Louis for prominence in this industry faded with the failure of the Missouri mines to yield the anticipated amount of ores and the only important development west of the Mississippi centered in Colorado, where the dominant organization had an output in 1900 of 150,000 tons.

Pig Iron and Birmingham

What was in some respects the most astonishing development of the industry in the post-war decades took place in the hitherto industrially retarded South with the Birmingham district of northern Alabama and adjacent Tennessee as the center of greatest growth. The rise of Birmingham began with a speculative townsite boom in the seventies when the iron industry was in that castles-in-the-air stage in which limitless possibilities are envisaged.⁸ Vast resources of coal and iron ore, in notable instances mined from the same hill, held out the promise of unusually low production costs and prompted the undertaking of scores of projects to realize this potential wealth. Wide publicity was given to the prediction of Sir Lowthian Bell, the British iron expert, that the low cost of assembling raw materials was destined to make the district one of the cheapest iron centers of the world. Substantial development got under way in the eighties when the Alabama blast-furnace industry outgrew that of every state except Pennsylvania. By 1894 Alabama and Tennessee together produced over 800,000 tons of pig iron, more than one-third of the metal produced in the nation, exclusive of that used

⁸ Ethel Armes, *The Story of Coal and Iron in Alabama* (Birmingham: published under the auspices of the Chamber of Commerce, Birmingham, Ala., 1910) gives a colorful picture of this phase of Birmingham's development.

for making steel. Large quantities were sent to Northern markets and there were considerable exports as well. After this promising beginning, the growth of the Southern iron industry slowed down to a pedestrian pace that in the years between the panic of 1893 and the First World War failed to keep up with even the rate of growth for the country at large. The South's production of pig iron in the years 1893-1903 virtually stood still and its share in the total pig iron product of the country declined by 50 per cent. The distance to Northern markets that provided the chief outlets for its products, the cost of reaching these markets, and the unsuitability of most Southern pig iron for Bessemer use both limited Northern demand and held back the manufacture of steel in the vicinity. Even though the bright promise of the early years was realized only in part, an iron and steel center of major importance had been added to the industrial resources of the country.

The Rise of Big Steel

It goes without saying that the extraordinary technical achievement and enormous expansion of production described above could hardly have occurred within the framework of the industry as organized in the years before the War Between the States, when the typical establishment was a small firm, organized as a partnership and operated with the caution and conservatism characteristic of the small-scale enterprise of that day. Pittsburgh's rolling mills, much above the average in size and investment, had an average capitalization of but \$156,000 in 1857 and the Cambria Iron Works, probably the largest in the country at that time, had an authorized capital of only \$1,000,000. Sums such as these were but petty cash in the finances of the giant corporations that within a few years came to dominate the scene. The vast plants required for efficient operation under the new techniques, combined with the advantages of owning ore and coal lands and transportation facilities, called for an outlay of tens of millions of dollars before a ton of metal could be turned out. Not least among the techniques indispensable to the functioning of the new iron and steel industry was that of managing bigness. Andrew Carnegie led the way and marked the path for others in this talent.

Carnegie

From bobbin boy to messenger to assistant railroad superintendent and spare-time venturer in profitable speculative schemes, Carnegie's rise to industrial leadership was an epic of the new industrial America.⁹

⁹ There is no adequate biography of Carnegie. B. J. Hendrick's *Life of Andrew Carnegie* (New York: Doubleday, Doran & Company, 1932) is good so far as Carnegie's social and cultural activities are concerned. For a useful antidote to this semiofficial life, see J. H. Bridge, *The Inside History of the Carnegie Steel Company* (New York: The Aldine Book Company, 1903).

His connection with the iron industry began during the years of civil war with an investment in a Pittsburgh mill, and was enlarged shortly after by an interest in a new blast-furnace plant. When, in 1874, Carnegie became the leading partner in the firm that erected the first Bessemer plant in the Pittsburgh district, the Edgar Thomson Steel Works, he was fully launched on the career that made his company within a few years the greatest steel producer of the country. Acquisition of the Edgar Thomson plant was followed by the purchase of Homestead, and later of Duquesne—all three major steel works occupying virtually adjacent sites on the banks of the Monongahela a few miles above Pittsburgh. The Carnegie enterprises presently included iron works, blast-furnace properties, and a bridge company as well. Alliances, which were equivalent to absorption, with the Oliver Mining Company on the one hand and with the Frick Coke Company on the other brought within the Carnegie orbit extensive ore properties in the Superior fields and the largest and richest coke properties in the country.¹⁰ Finally, in absorbing the Lake Superior Iron Company the Carnegie organization became an important shipowner and the largest shipper of ore on the Great Lakes. These facilities, together with a controlling interest in the Pittsburgh, Bessemer, and Lake Erie Railroad, made the company independent in the matter of ore transportation. The capital of the parent organization in the meantime mounted from \$5,000,000 in 1879 to \$25,000,000 some 12 years later, and when the company was at last incorporated in 1900 it had a capital stock of \$160,000,000, of which Carnegie controlled over \$86,000,000.

Carnegie's contributions to this development were of central importance. As an ironmaster he contrasted sharply with the typical Pittsburgh millowners of the previous generation. He knew little of iron and steel and spent little time in plant or mill. He did not get down to the works before his men in the morning nor did he pride himself on hard labor and long hours. His summers were usually spent vacationing abroad; and in the social life of New York and Pittsburgh he was an active participant, combining thoroughgoing pleasure with not a little business profit. Carnegie was a supersalesman and customer's man who cultivated with great success the friendship of men of financial and industrial prominence; a skillful judge and manager of people, with the ability to select highly competent plant superintendents whom he bound to him with fractional interests in the company and spurred on by a system combining rivalry with detailed, personal reports forwarded to him wherever he might be; and a leader who, without technical knowledge,

¹⁰ Henry Clay Frick was the stormy petrel of the Carnegie organization. For an account of his relations with Carnegie and his role in the industry, see the authorized biography by George Harvey, *Henry Clay Frick, the Man*. New York: Charles Scribner's Sons, 1928.

had the imagination and foresight to exploit to the utmost the newer technological developments of proved worth. Unhampered by the craftsman's respect for his tools and the petty capitalist's reluctance to abandon a machine so long as it served well, Carnegie was one of the first industrialists to discover the profits of a policy of hard driving and early scrapping of equipment. So skillfully were the Carnegie properties managed under his direction, so efficiently were blast furnaces, rolling mills, and converters operated, that production costs were driven far below those of most other companies, and in a bitterly competitive field great fortunes were piled up for Carnegie and his associates. In prosperous years profits amounted to \$20,000,000 and more.

Consolidation is the life of trade.

Carnegie was but the leader in a trend that was general throughout the industry in these years, although there were few indeed who found or made the sailing so smooth as he. For most men, indeed, the long and bitter competitive struggle, intensified by high fixed charges and by the marked fluctuations in business conditions felt with particular severity in the iron and steel industry, ended more often in disaster and defeat than in success. The years between 1865 and 1900 were filled with many and varied attempts to restrain and relieve competition. Pools that divided the market, allotted production quotas, fixed prices, or served as marketing agencies were common, but in the main did no more than blunt the edge of competition, serving chiefly to hasten the trend toward large-scale, integrated operations through consolidation, either along the line followed by the Carnegie company or by combinations of plants of the same kind. No major iron and steel district escaped the influence of this powerful trend. Bethlehem Steel and Pennsylvania Steel on the Seaboard, Tennessee Coal, Iron and Railroad in the South, Colorado Fuel and Iron in the Far West, and Illinois Steel, later absorbed by Federal Steel, in the Chicago district—all these were giant organizations, integrating in varying degrees the manufacture of iron and steel products from the materials to finished commodity. Organization of a great number of combinations or trusts of the horizontal kind brought together companies engaged in the production of similar goods—iron, ore, forgings, tin plates, steel hoops, barbed wire, steel pipes and tubes, cast-iron pipes, and the like. There was room too for outstanding independent companies such as Jones & Laughlin, Cambria Steel, and Lackawanna Steel. At least as large as and even more diversified in its activities than Carnegie Steel was the Federal Steel Company with properties and major operations centering in Chicago. In 1899 this giant company with its 21,000 employees produced nearly 3,000,000 tons of ore and 1,500,000 tons each of pig iron and Bessemer ingots. Extensive ore and coke lands, railroads, steamships, and docking facilities, as well as the usual

blast-furnace, Bessemer, and rolling-mill plants, were among its properties.

The billion-dollar business

All these earlier combinations were dwarfed in 1901 by the organization of the United States Steel Corporation, a combination of combinations that brought together 12 of the largest companies in the United States, including the Carnegie properties and the Federal Steel Company.¹¹ Only this union of interests forestalled the impending renewal of the battle of the giants on a vaster scale than hitherto. Carnegie, who had achieved glory and profit enough and was ready to retire to the more leisurely pursuits of social intercourse and philanthropy, had no taste for the struggle. Elbert H. Gary, moving spirit in Federal Steel and later chairman of the board of the Corporation, had earlier proposed a combination of this kind. Charles M. Schwab, chief lieutenant of Carnegie and soon to become the dominant spirit of Bethlehem Steel, succeeded in prodding J. P. Morgan to assume the role of an architect of a colossus that would impart to steel the order, stability, and profit that made up the trinity of the great financier.¹² The blast furnaces of the new \$1,400,000,000 corporation produced one-half of the pig iron output of the country and its rail mills over one-half of the steel rails. It controlled some 60 per cent of the national output of structural steel and of wire and wire rods, virtually all the barbed wire and woven fence wire, wire nails, tin plate and steel tubes, and large proportions of other major steel products. It built some nine-tenths of all the bridges in the country. It dominated the Superior ore fields and ore traffic on the Lakes and produced more than half the coke made in the United States. The policy of absorption and expansion did not stop with the organization of the Corporation; within a few years the largest iron and steel firm in the South, the Tennessee Coal, Iron & Railroad Company, was taken over in a transaction that threatened to become a national scandal, and on the swampy shores of Lake Michigan not far from Chicago a \$50,000,000 steel works and industrial town was erected bearing the name of Chairman Gary. Despite these and other expansions of plant, the Corporation's hold on the market gradually fell off in the decade following its organization but without fundamentally altering its influence as a stabilizing force, exercised through the power of example and sugges-

¹¹ For interesting accounts of the circumstances leading to the formation of U. S. Steel, see H. R. Seager and C. A. Gulick, Jr., *Trust and Corporation Problems* (New York: Harper & Brothers, 1929), Chapters 13 and 14; and Lewis Corey, *The House of Morgan* (New York: G. Howard Watt, 1930), Chapter 23.

¹² Corey's *House of Morgan* is one of the few good biographies of American business leaders and should be read by all interested in understanding the course of industrial development in the late nineteenth century.

tion and facilitated by the growing feeling of community of interest that marked the maturity of this fundamental heavy industry.¹³

One final merger of major importance rounded out this phase of the steel industry's development. This was the absorption by the Bethlehem Steel Company during the First World War and post-war years of a number of other large independent companies in the East, notably the Cambria, Pennsylvania, Lackawanna, and Midvale steel companies. The result was to make Bethlehem Steel the dominant organization in the East and the largest independent company in the country. In 1930 six great steel combinations controlled 75 per cent of the national output.

Ordnance and armor plate

In the field of heavy machinery the chief developments in the latter part of the nineteenth century centered in railroad equipment, stationary and marine power plants, and naval ordnance and armor. Foundry and forging techniques advanced to new levels in the effort to cope with the problems of shaping iron and steel in large masses. The War Between the States brought not only demands for heavy ordnance but called on industry to supply iron plates of unprecedented thickness for the monitor fleet and for armored gunboats. At the opening of the war one and one-half inch plates were the largest that could be rolled in any existing mill, but before its end plates up to five inches thick had been made by both rolling and forging. Nothing permanent came out of this activity for in the retreat from steam and armor that marked the post-war navy there was no business for heavy industry. In the 1880's a program of naval expansion called for large armored battleships and laid the foundations for a naval-construction industry on a permanent and expanding basis, favored by legislation requiring the use of American materials. By 1909 naval appropriations reached the unprecedented peacetime figure of \$140,000,000 and the bulk of this went into the enlargement of our rapidly growing battleship fleet.¹⁴ The specialized nature of the demand and the heavy investment for the necessary equipment, much of which had to be imported in the early years, confined the production of armor plate and ordnance to a handful of firms. The two major steel companies to engage in the manufacture of armor plate were Carnegie and Bethlehem, each of which in 1886 began the erection

¹³ By 1929 the percentage of the national output of crude steel produced by the Corporation had declined from a onetime figure of 65 per cent to 40 per cent. The effort of the Federal Government to dissolve the Corporation as a combination in restraint of trade came to an unsuccessful end in 1920 with a Supreme Court decision favorable to the Corporation.

¹⁴ For the political and international background of this significant development the reader should consult the illuminating study of Harold and Margaret Sprout, *The Rise of American Naval Power, 1776-1918*. Princeton: Princeton University Press, 1939.

of armor-plate plants. Bethlehem got its first order in 1887 and by 1891 the Carnegie works were able to roll nickel-steel ingots weighing 50 tons. These developments quickly freed the United States from dependence on foreign makers of armor plate. The most important technical improvement in this field came with the substitution of powerful hydraulic forging presses for rolls in the production of the heavier plates.

The heavy ordnance of the period of the War Between the States, including cannon up to 20 inches in bore and throwing shot weighing as much as 1,000 pounds, was made by casting. The Fort Pitt Foundry in Pittsburgh, long a leading producer of ordnance, delivered more than 2,000 heavy pieces to the Government during the war. The lathe required for finishing the larger pieces weighed more than 100 tons. The trend of the post-war years was away from cast ordnance to breech-loading guns forged from wrought iron and steel. Owing to the limitations of American forging equipment the Government arsenals were for many years dependent on foreign makers for heavy gun forgings, but by importing ordnance machinery from abroad our own manufacturers were able by 1893 to produce the largest guns required by our expanding navy. The use of the hydraulic forging press in place of the heavy steam hammer was of great importance, turning out a better product at lower maintenance cost and handling material with greater facility.

Heavy machinery

In the field of heavy industrial equipment the most significant developments of this period lay not so much in the expansion of existing lines as in the great increase in the variety of equipment and in the creation of specialized branches of industry to produce them. In the early stage of our industrial growth specialized equipment required by a new branch of industry had usually to be designed and built by the user or by general foundry and machine shops that made equipment to order. When the demand became sufficiently great, companies were organized to produce exclusively a given class of equipment. The building of steam engines—stationary, steamboat, and marine—and locomotives provides outstanding examples of this development in the period before 1865. The manufacture of specialized equipment experienced a continued expansion and development in the post-war years and was joined by many other branches producing equipment demanded by the extension of industrialization to new areas, especially for handling and processing materials efficiently in large volume.¹⁵ Included among these products were heavy-duty cranes of many kinds; dredging and excavating equipment; conveying and elevating machinery; mining, oil-well,

¹⁵ Material on this subject is buried for the most part in census reports and trade journals.

and refining equipment; and many others. To steam engines of the older reciprocating type were added steam turbines. With the coming of electric power a whole new class of generating and motor equipment was introduced and the production of electrical machinery became a major industry. In 1929 manufacture of locomotives was exceeded in value by both dredging and excavating equipment and by oil-well machinery, and was nearly equaled by electric motors and dynamos. The value of mining machinery and of conveying and elevating machinery produced in this year was greater by at least one-fourth than steam engines and turbines, and the value of steam turbines to that of reciprocating engines was in the ratio of five to one.

Locomotives and rolling stock

Although railroads ceased to dominate the heavy industries, their equipment requirements nonetheless continued to make them one of the major outlets. Only in comparatively recent years has the demand for locomotives and rolling stock tended to level off. Increase in size as well as numbers has been characteristic of both branches of equipment. A 30-ton locomotive at the close of the War Between the States was regarded as exceptional, but by 1900 a 70-ton engine was quite common and the largest built up to this date weighed 133 tons. Production of locomotives followed the trend of other commodities toward concentration in fewer hands. The Baldwin Company, long the largest in the country, continued to dominate the field, increasing its output from 500 locomotives in 1873 to more than 2,600 in 1907. The early years of the new century, which witnessed the formation of so many giant consolidations, brought all the locomotive manufacturers of the country, save only Baldwin, together in a \$50,000,000 corporation, the American Locomotive Company, whose nine works, located chiefly along the Atlantic Seaboard, produced a slightly larger number of locomotives in the aggregate than Baldwin.

In rolling stock the small wooden cars of the fifties and sixties gave way to steel cars of many times their capacity. During the War Between the States, the normal capacity of railroad cars was 7 to 8 tons; by 1885 the figure had risen to 30 tons, and at the turn of the century cars of 40 to 50 tons were in common use and larger ones were still to come. The increasing adoption of the steel car was a major development of the period. In 1880 a steel car cost several times as much as the usual wooden one, but by 1900 the cost was reported to be the same for cars of equal capacity. By 1906 45 per cent of the cars in the country were either made entirely of steel or steel was used for all parts except the body. Mergers brought this branch of industry into the hands of a few large companies of which the Pressed Steel Car Company of Pittsburgh was the most important. Using 1,600 tons of steel daily

this company was said in 1900 to be the largest single consumer of steel in the world. In 1906 the Pennsylvania Railroad placed the first regular order for all-steel passenger coaches, beginning a trend that was to relegate the old-fashioned wooden coaches to minor branch lines and local service. By the end of the century the production of sleeping cars had been concentrated in the hands of the Pullman Company.

Shipbuilding in the Age of Iron and Steel

While the railroad continued to provide the major source of demand for heavy goods and equipment, developments in the field of ocean transportation gave rise in the closing years of the nineteenth century to what in all logic should be classed with heavy industry, the building of iron and steel ships. The building of wooden ships, which had long brought much profit and no little fame to this country, could hardly be so described, despite the ponderous character of the materials used—single spars and masts often weighed many tons—and the large dimensions of the product. Down to 1860 shipbuilding had advanced little beyond the handicraft-small-shop stage of organization. Although there were some large concerns, employing 100 men or more, the typical *ante bellum* shipyard represented but a small investment of capital and possessed little in the way of plant and equipment, employing relatively few men and turning out only a few ships of modest tonnage each year. With ships small in size and abundant timber available along a large part of the Eastern Seaboard, shipyards were set up easily and operated to advantage on many a small inlet and tidal stream. Decentralization was a characteristic feature of an industry dominated by the individual proprietorship and the partnership, with the master carpenter typically serving as the directing head. The corporation was almost unknown and consolidation a thing of the future.¹⁶

Already at mid-century the days of the wooden sailing ship were numbered as ships built of iron and driven by steam demonstrated their effectiveness. The trend from sail and wood to steam and steel resulted in radical changes in the organization and conduct of the shipbuilding industry. Where 40 years earlier 500-ton vessels were few in number, in the sixties ships of 2,000 tons became common and capital investment mounted from \$20,000 to \$140,000. The construction of iron ships presented problems and demanded organization, techniques, and equipment differing markedly from those characteristic of wooden shipbuilding. Elaborate and costly equipment, a heavy capital investment, and large-scale operations were the distinctive features of shipyards

¹⁶ Much the best treatment of the history of shipbuilding in the United States is the careful and comprehensive study of John G. B. Hutchins, *The American Maritime Industries and Public Policy, 1789-1914: An Economic History*. (Cambridge, Mass.: Harvard University Press, 1941.)

building steamships of iron and steel. Moreover, the new industry required at its base a supporting structure of heavy metal and engineering industries to supply the essential raw materials, fabricated parts, and machinery that went into the modern ship. The building of the new class of ships developed slowly in the United States. This was due in part to the decline of the American merchant marine and to the greater attractions of other fields of capital investment, but no less to the earlier start obtained by the industry in Great Britain and to the advanced state of the metal and engineering industries in that country. The advantages possessed by the United States in its rich timber resources and its craftsmen skilled in the technology of wood could not be transferred to the new industry. The shift of major centers of iron and steel production inland in this period, together with steel pricing policies, introduced freight charges with which British shipyards did not have to reckon; labor rates were high; and the protecting umbrella of the tariff added further to construction costs. Engineering industries capable of supplying machinery and equipment for steamships of rapidly mounting tonnage were in a stage of crude beginnings.

Under these conditions the tonnage of iron ships built in the country prior to 1860 was negligible. In the post-war decades production mounted slowly as experience was gained in the new methods, but activity was confined to a few shipyards and to steamships of modest tonnage, chiefly for use in the protected coastal trades. In the eighties came the stimulus of naval construction, leading to the establishment of a few large yards, elaborately equipped with special machinery for handling and fabricating materials and with a capacity for ships of large tonnage. The capital investment of iron shipbuilding yards mounted from an estimated \$50,000 in 1886 to \$1,000,000 in 1900. A companion industry arose on the Great Lakes in the eighties and nineties where, at various points from Buffalo to Chicago, yards were established to build vessels for the rapidly expanding grain and ore trade. Sixty per cent of the steam tonnage built in the United States in the decade, 1891-1900, was turned out from these yards. A protected market and marked progress in the organization and techniques of production were insufficient to overcome the handicaps of high material costs, due particularly to the monopolistic situation in the steel industry, and the low wage rates enjoyed by foreign shipbuilders. Total output in the nineties was little more than one-tenth that of British shipyards. Output mounted from an annual average tonnage of about 100,000 in the years 1891-1900 to 250,000 tons in the period 1910-1914 and then shot up abruptly under the pressure of war demands. In the two decades of peace that followed output sagged to a point much below pre-war levels.

The Rise of Copper

In the nonferrous-metal industry, the most notable development in this period took place in the copper industry. Annual output rose from some 8,000 tons just prior to the War Between the States to more than 800,000 tons in the middle 1920's, a rate of increase several times that of iron and steel. In contrast with the earlier period, when it found its principal outlet in sheathing and fastenings for ships and in the manufacture of brass, copper now became a vital industrial metal with a wide range of conversions into capital and consumer goods alike. The most important of these new uses, accounting for from one-third to nearly one-half of the total copper product in the twenties, were those associated with the coming of the age of electricity. Electrical equipment and machinery of all kinds, transmission lines, and wire rapidly claimed the lion's share of copper. Other important industrial uses were found in alloy bases, bearing metal, and automobiles. The increase in copper production was relatively slow up to 1880 with an annual average for the period 1876-1880 of just under 25,000 tons. By 1890 output was up to 130,000 tons and the period of greatest growth lay just ahead. By 1895 the United States had deprived Great Britain of the position she long held as the world's leading producer of copper and in the twenties this country produced nearly one-half of the world output.

Opening of the Western copper fields

The important developments of the late nineteenth century were associated with the discovery and exploitation of new ore districts, invention of new techniques of reduction and refining, and concentration of ownership and control in the several branches of the industry.¹⁷ Down to 1880 the bulk of the copper produced in this country came from the Michigan district where during the seventies some 85 per cent of the national product was made. Michigan's dominance was challenged and within a few years overthrown when discoveries in the seventies and eighties brought into production the rich copper districts of Montana and Arizona. By 1885 Montana's output nearly equaled and five years later had passed that of Michigan, and by 1910 Montana and Arizona together accounted for 54 per cent of the national output as compared with Michigan's 20 per cent. The Butte district of Montana was the first of the new copper fields to come into production.¹⁸ Butte began

¹⁷ The best study of the copper industry in this period is F. E. Richter, "The Copper Mining Industry of the United States, 1845-1925," *Quarterly Journal of Economics*, Vol. 41, pp. 236 ff., 684 ff.

¹⁸ The more spectacular features of the development of the Butte district are treated in C. B. Glasscock, *The War of the Copper Kings: Builders of Butte and Wolves of Wall Street* (New York: Grosset and Dunlap, 1939). For a fuller and more thorough discussion consult Robert G. Raymer, *A History of Copper Mining in Montana* (Chicago: Lewis Publishing Company, 1930).

as a gold- and silver-mining camp but disappointments in these metals turned attention to the exploration of copper lodes. With the striking of rich copper ore in the Anaconda mine and the completion of a railroad connection to the East, copper production in this area shot upward. By 1887 the Anaconda was the chief producing mine in the United States and a competitive struggle between it and Calumet and Hecla, leading Michigan producer, cut copper prices in half. Arizona followed more slowly, beginning with the development of the Globe and Copper Queen districts in the seventies and eighties. In 1890 this state was producing but one-eighth of the national product, but by 1925 it had moved into the leading position among the copper-producing states, accounting for 43 per cent of the country's total as compared with 30 per cent for Montana and Utah combined and 8 per cent for Michigan.

Development of low-grade ores

While many of the Western ores first exploited showed as high a copper content as those of the Michigan field, native copper excepted, and were concentrated without difficulty by the customary methods of stamping and washing, the general yield steadily declined in quality as the higher-grade ores were exhausted. Within a few years producers were faced with the problem of reducing bodies of ore assaying but four to six per cent copper. Even with improvements in the older methods of concentration, four-per-cent ore ordinarily proved profitable only because of the gold and silver associated with it. A revolution in mining and concentration methods was necessary before the enormous and long unknown porphyry deposits of the West, assaying for the most part between 0.75 and 2.5 per cent, could be successfully exploited.¹⁹ Their recovery was a technological and engineering feat of the first order. It was effected in part by the adaptation of the stripping and open-cut methods of the Mesabi iron ranges but in greater part through the development of the oil flotation method of concentration. In this ingenious process the heavier minerals are made to rise to the top of a mass of water by mixing them, after a preliminary fine grinding, with oil and driving air through the mixture. The metal-bearing froth that forms is readily skimmed off and the oil then separated from the ore concentrate by the application of heat. This flotation method made possible a high recovery of metal from very low-grade ores. In some instances ores containing as little as 11 pounds of copper to the ton were exploited successfully. Production in the porphyry mines got under way about 1905 and 10 years later 6 of them accounted for nearly 30 per cent of the total copper product of the United States. By 1923 the average

¹⁹ On the technical problems involved in the handling of the porphyry ores and details of their solution, see A. B. Parsons, *The Porphyry Coppers*. New York: American Institute of Mining and Metallurgical Engineers, 1933.

recoverable content of copper ore mined in the United States was estimated at but 1.58 per cent.

New refining methods

In the smelting process the trend was from the shaft type to the reverberatory type of furnace. The reasons for this change lay chiefly in the difficulty of handling in the shaft furnace the finely divided ores required by the flotation process. Eventually the great bulk of copper ores in the country was reduced in great reverberatory furnaces with a capacity of 100,000 tons and more per year. In the later stages of refining, two innovations were of chief importance: the adoption of the Bessemer process for reducing to crude or blister copper the matte produced in the smelting operation and containing 40 to 50 per cent copper, and the use of electrolysis in the final stage. The first technique resulted in a great saving of time, labor, and fuel and has been described as doing almost as much for copper as it had for steel. Electrolysis, applied in vats of great size, not only gave a purer copper than obtainable heretofore, but resulted in a virtually complete recovery of the copper contained in the crude metal. This method, introduced in the eighties, spread until in recent years more than 80 per cent of the copper in this country has been refined by it.

Big business in copper

The organization of the copper industry in this period was marked by a continuation of trends already evident in the Michigan field before 1850. The cost of deep-mining operations and the advantages of large-scale operations called for a heavy capital investment that the smaller companies were unable to obtain. Again and again the smaller producers in a district were squeezed out or absorbed by larger companies, not so much by such practices as price cutting and local underselling, so effectively used in other industries, as by their sheer inability to approach the production costs of the big companies. Technological improvements calling for progressively larger operations and more costly equipment to handle ores of lower grade added to the already heavy capital requirements of the industry and promoted concentration of ownership. The wide range between costs and selling price that was customary with the larger companies prior to the First World War meant high and often extraordinary profits. The Calumet and Hecla Mining Company, for example, paid total dividends of nearly \$28,000,000 in the years 1871-1886, or an annual average of 144.5 per cent. While production costs of Calumet and Hecla in this period ranged between 5 and 10 cents a pound, copper brought 20 cents most of the time in New York City. The wide margin between cost and selling price not

only served as a cushion in the occasional competitive wars between the larger companies but, prior to 1900, provided the basis for expansion of production largely without resort to the public security markets and tended to keep control within the industry.

A trend toward consolidation of properties and interests appeared early in the copper industry, and in few other branches of manufacturing has this development been carried further. The four companies with the largest holdings of ore in 1925 controlled 45 per cent and the 16 leading companies over 83 per cent of the estimated ore reserves of the country. In each of the major copper districts the tendency was to concentrate production in the hands of one or two large companies whose interests in most instances did not extend to other districts. The big four in the mining of ore—Anaconda, Kennecott, Phelps Dodge, and Calumet and Arizona—produced 51 per cent of the national output in 1929. Of this amount Anaconda alone accounted for more than half, or 27 per cent. In the smelting of copper the big four in this year were American Smelting and Refining, Phelps Dodge, United Verde, and Anaconda. In contrast with the earlier period nearly all the larger companies not only mined ore but concentrated and smelted it in the immediate vicinity. Beyond this point integration was not often carried. In general, fabrication was separated from the production of raw metal, and similarly the greater part of copper was refined not by the companies producing it but by refining companies operating on a toll or contract basis. The outstanding exception was the Anaconda Copper Mining Company, which not only operated great refining plants in Montana and New Jersey but in its subsidiary, the American Brass Company, controlled the greatest consumer and fabricator of copper in the world. With total assets in 1929 of more than \$750,000,000 Anaconda owned, besides ore reserves, mines, and smelting and refining plants, collieries, timber reserves, and sulphuric-acid, zinc, lead, and oil works, as well as a railroad and numerous foreign mining properties. The dominant organization in the refining of copper has long been the American Smelting and Refining Company, organized in 1899 and soon brought under the control of the Guggenheim group.²⁰ Primarily a horizontal combination, American Smelting and Refining soon established itself as the foremost refiner of copper in the world and was for years its greatest seller. With Anaconda it stood out as one of the two largest nonferrous organizations in the world. Between them they disposed of from two-thirds to three-fourths of all the copper refined in the United States and Latin America.

²⁰ The story of the role of this family in copper has been told in popular biographical style by Harvey O'Connor in *The Guggenheims: the Making of an American Dynasty*. New York: Covici, Friede, Inc., 1937.

The Production of Lead

As with copper the large-scale development of the lead industry has taken place chiefly since the War Between the States and the pattern of organization and technology in the two industries has been much the same.²¹ After leveling off during the fifties and sixties, production mounted rapidly after 1870 until in the years 1920-1929 the annual output of the United States averaged close to 600,000 tons, about two-fifths of the world product. The principal new uses to which lead was put with the advance of industrialization were, as in the case of copper, those arising from the electrical age. Storage batteries and cable sheathing in recent years have accounted for nearly half the total supply of lead. Of the older uses, white lead for paint continued in top place. The great expansion of production in this period is associated with the development of the silver-bearing ores of the Rocky Mountain region and the large deposits of low-grade disseminated ore of southeastern Missouri. Exploitation of the Rocky Mountain area dates from the discoveries of lead ores in Nevada and Utah in 1869-1870 and was made possible on a significant scale by the completion in 1871 of railroad connections that enabled the ore to reach a market. The eighties were marked by the development of the Leadville, Colo., district, which for a few years supplied one-third of the total United States product. In the next decade the Coeur d'Alene district of Idaho entered upon the development that was to make it one of the principal lead areas of the United States. Of even greater importance were operations in the southeastern district of Missouri, where rich, near-surface ores had long been exploited. The really big development of the district dates from 1869 when a lead company began prospecting for deep deposits with a diamond drill, and uncovered extensive areas, hundreds of feet thick, of a low-grade ore with a metallic content of between four and six per cent, the practical extraction of which called for large-scale operations and a heavy investment of capital. This district became the largest producing area in the United States, contributing in 1921 about one-third to the national output.

With respect both to technical aspects of concentration, reduction, and refinement, and to the organization of the industry, lead presents substantial similarities to copper. Varying amounts of silver, zinc, gold, and other metals in association with much of the lead ores affect appreciably and often markedly the cost of production. Smelting and refining operations were carried on in the larger industrial centers of the Middle West and the Atlantic Seaboard with San Francisco occupying a leading

²¹ Although old, W. R. Ingalls, *Lead and Zinc in the United States* (New York: Hill Publishing Company, 1908), is still the only work that gives much attention to the historical side of the industry's development.

position on the Pacific Coast. Active and at times bitter competition among smelters and refiners led here, as in other areas, to agreements and associations and eventually in 1899 to the formation of what was once known as the lead trust, the American Smelting and Refining Company, which acquired a dominant position in the lead as well as in the copper industry. Today the bulk of mining and reduction of lead ores is concentrated in the hands of a small number of large-scale organizations.

Coal

The coal industry that in the preceding period established so firm a position for itself both in the domestic and in the industrial economy of the nation strengthened that position step by step with the advance of industrialization.²² The power and heat supplied to industry by coal increased rapidly in the second half of the nineteenth century. By 1880 steam passed water power in importance as a source of industrial energy and by this time, too, coal had become the most important metallurgical fuel. For a generation the position of coal in our economy was unchallenged and even with the rise of competing sources of energy coal continued to supply the greater part of the nation's requirements. Anthracite, steadily displaced by bituminous coal for most industrial purposes, was confined increasingly to domestic use. Its production leveled off about 1913 and began to decline about 1920. Bituminous coal reached its peak during the First World War and thereafter declined, subject to marked fluctuations in annual output. Comparing average annual production in the years 1936-1940 with that of the war period, 1916-1920, anthracite coal fell off in production 45 per cent and bituminous 22 per cent.

Changes in the use and consumption of coal were not many in this period but they were important. Although the use of charcoal for metallurgical purposes continued to increase, in an absolute sense, down to the last quarter of the nineteenth century, coal rapidly reduced it to a position of negligible importance in this field. Coal in general supplanted wood as fuel and was used in increasing amounts to manufacture gas for domestic uses of a population in rapid process of urbanization. Undoubtedly the most important of the new demands for coal were made by the railroad locomotives that had so long been stoked with wood. Railroads reached a peak consumption of 28 per cent of the total output of bituminous coal in the first decade of the twentieth century. Al-

²² There is a crying need for a history of the coal-mining industry in this country, especially for the bituminous fields, that has been met only in part by the recent work of H. N. Eavenson, *The First Century and a Quarter of American Coal Industry* (Privately printed, Pittsburgh, 1942). Within its scope, Eliot Jones, *The Anthracite Coal Combination in the United States* (Cambridge, Mass.: Harvard University Press, 1914), is excellent.

though this percentage fell off to about 20 per cent in the thirties, the railroad was long the greatest single consumer of coal. Only in recent years have coke ovens, the next most important outlet for bituminous coal, approached and at last equaled locomotives.

The most significant developments in the technology of coal mining can be summed up in the word mechanization. Progress was slow until the close of the century, owing principally to the difficulty of applying steam power to underground operations. Electricity and compressed air altered the situation and after 1900 the introduction of mechanical devices for cutting and undercutting as well as hauling proceeded rapidly. By 1929 fully three-fourths of the coal mined was undercut by machines and today there are comparatively few even of the "wagon mines" without mechanical equipment. Mechanical loading and the use of conveyors to carry coal from the mine were adopted more slowly before 1929, when only three to four per cent of the coal mined was moved mechanically. During the thirties mechanization of these operations advanced steadily and today fully one-third of the nation's coal is loaded and conveyed by machines. Stripping or open-cut mining has been introduced with success at some places in the Middle Western fields. A notable development in the closely allied field of coking, which prepares fuel for the iron and steel industries and for other industrial purposes, has been the replacement of the wasteful beehive oven by the retort oven with a consequent saving of valuable by-products, including the important coal tars. By-product coke increased from 3 per cent of the total in the late nineties to an average of 96 per cent in the 1930's.

The geography of production

No radical changes in the geographical distribution of the coal-mining industry took place in this period. Anthracite production, except for negligible amounts, continued to be confined to northeastern Pennsylvania and gave way to bituminous coal as the major industrial fuel. In the bituminous industry the center of production moved slowly westward, owing to the rising importance of the Middle Western fields. In the trans-Mississippi region the most notable development occurred in Colorado, but Kansas, Iowa, Wyoming, and several other Western states eventually added some millions of tons each to the national coal output. More important was the rise in the South of the Birmingham district, where the demands of the iron and steel industry made Alabama one of the leading coal states in the country. Despite developments elsewhere Pennsylvania continued to lead the field in bituminous production until West Virginia forged ahead after 1930. In recent years Pennsylvania, West Virginia, and Illinois have together accounted for more than three-fifths of the national output.

Depression in coal

The most interesting developments in the coal industry during this period are found not in the field of technology or in regional-production trends but rather in the organization and general economic condition of the industry. The production of coal, basic as it has been in America's industrial structure, attained the unenviable distinction of becoming America's first depressed industry, suffering from chronic overproduction and disorder during the past half century. The causes of the industry's troubles have been above all the enormous extent of coal lands suitable to commercial development, the decline in the use and demand for coal, and the system of private ownership that permits owners of this basic resource to develop or withhold it at will and to extract it in the manner most advantageous to private profit. These factors have resulted in the development of mining capacity far in excess of demand, a high degree of plant and labor idleness, excessive competition aggravated by high fixed charges, much labor-management trouble, and very wasteful methods of extraction. There have been at all times favored districts and mines that have enjoyed a good measure of prosperity and some stability. In the slump that set in after the First World War, the bituminous industry was more seriously affected than the anthracite.

The anthracite combination

With respect to many features of its organization and development the anthracite industry belongs in a class by itself.²³ The disorder and instability characteristic of the bituminous industry have largely been lacking. The localization of industry within a small and compact territory and the early concentration of ownership in the hands of a few large companies made possible and encouraged an orderly development. The railroads, which in the years following the War Between the States came to own the great bulk of the anthracite fields and to engage directly or indirectly in the mining of coal, were faced for a time with the problem of active and uncontrolled competition, both among themselves and with independent operators. Prices, profits, and wages were beaten down with resulting disorder at times approaching chaos. Relief from this situation was secured by the adoption and extension of pooling agreements that fixed the total quantity of coal shipped from the region, allotted percentage quotas to members, established penalties for noncompliance, and in many instances fixed prices. Eventually the anthracite

²³ In addition to the Jones study cited above, see the accounts of the findings of the United States Coal Commission in E. C. Hunt and others (eds.), *What the Coal Commission Found* (Baltimore: Williams & Wilkins, 1925) and E. T. Devine, *Coal* (Bloomington, Ill.: American Review Service, 1925).

combination perfected its arrangements with such skill that disorder and instability were a thing of the past. Each railroad was made responsible for seeing that the coal carried by it, including that mined by independents, did not exceed its quota. The larger independent companies were tied up with contracts for their entire output at a definite and attractive percentage of the selling price, thus eliminating one source of competition and barring traffic from rival railroads. By combined action the pool succeeded in blocking the construction of new railroads that would provide independent access to markets. Annual production was stabilized at the amount that the market would profitably absorb. In these ways the development of the anthracite region was carefully regulated and the extremes of competition and overdevelopment that plagued the bituminous industry were thereafter unknown to it. If such measures did nothing to prevent and possibly aided the eventual decline in production, there was some compensation in the steadily upward trend in prices.

Competition is the death of trade.

Quite different conditions emerged in the bituminous industry. The area of bituminous production spread steadily until some 30 states were engaged regularly in the commercial mining of coal and others were ready to join in when market conditions were favorable.²⁴ There was no typical operator, as in the anthracite field. At one end of the scale were the great corporations, including the "captive mines," owned and operated by steel companies, railroads, and other enterprises to supply their own needs, and producing by 1920 one-fourth of the national output, to the "wagon mines" and "country banks" that turned out in many instances less than 1,000 tons annually. In addition to the mines that within the limits of normal demand operated more or less regularly throughout the year there were hundreds of "snow-birds," the little mines with high costs of production that began working at the height of the season's demand each winter to take advantage of a favorable market and high prices. In marked contrast with the 174 producers operating in the anthracite fields in 1920 there were 12,212 bituminous producers operating 14,766 mines of which 5,845 were wagon mines and country banks operating on a small scale.

Labor and coal

Labor-management difficulties have been another source of instability and disorder in the bituminous industry. Wages make up an unusually high proportion of costs in coal mining, estimated at between three-fifths

²⁴ See the summaries of the findings of the United States Coal Commission in the books cited in the previous footnote.

and two-thirds of total cost. Excessive competition between operators inevitably led to wage-cutting that brought miners' incomes down in many instances to intolerable levels. Caught between the hammer of low wages and the anvil of under-employment, the miners countered with organization. The ensuing conflict of interests led to some of the most bitter strikes in our industrial history, in some notable instances culminating in bloody clashes that were literally civil war.²⁵ In the anthracite industry order was early established in the relations between miners and operators through the success of the United Mine Workers in bringing the miners into the union and forcing the operators through the strike and the pressure of public opinion to deal with their employees on something approaching terms of equality.²⁶ Intervention of the Federal Government in the strike of 1902 led to the setting up of machinery for conciliation and adjustment of disputes under which there have been few major strikes and little disorder.

Organization in the bituminous industry with its thousands of mines scattered widely over the country presented quite a different and far more difficult problem. Having reached a fair measure of agreement and harmony on production and prices, the anthracite operators could accept unionization and higher labor costs without weakening their competitive position with reference to each other and without great material sacrifice, however great the blow to their pride. The marginal position of many bituminous operators, on the other hand, made them highly sensitive to so major an item of cost as wages, and the advance of unionization in some districts served chiefly to sharpen the struggle by placing them at a disadvantage in competition with nonunionized districts. The very number of mines and the wide differences in size and competitive position that impeded agreement among bituminous operators on such matters as production and prices also prevented common action against labor.

Under such adverse conditions competition was always active and often degenerated into a bitter, cutthroat struggle for existence. So long as the general trend of consumption and demand was upward, the expanding requirements of industry could be counted on to take up the slack resulting from temporary periods of overdevelopment. But with the leveling off and then the decline of demand, chronic depression was the inevitable lot of the industry as a whole, relieved only by occasional and exceptional conditions. On the one hand, the older mines with considerable capital investment that could not be released were compelled

²⁵ Excellent accounts of some of the worst of these struggles may be read in Samuel Yellen, *American Labor Struggles*. New York: Harcourt, Brace & Company, 1936.

²⁶ For the life of the man primarily responsible for the success of the miners in the anthracite field, see Elsie Glück's *John Mitchell, Miner*. New York: The John Day Company, 1929.

to continue in operation despite diminishing returns and failure to show a profit. On the other hand, the advantages of developing new fields where the cream was easily skimmed with a minimum of investment were often so tempting that new mines were continually being opened in disregard of the already overdeveloped state of the industry. Between 1910 and 1915 over 300 mines were opened annually, and under the stimulus of war demands this figure mounted to 454 in 1916 and 1,543 in 1918. Railroads in search of new sources of traffic encouraged this expansion by building branch lines and offering attractive preferential rates to bring new fields and new mines into production. Once equipped and in operation, such mines were a permanent addition to the productive capacity of the industry with stockholders and miners alike interested in maintaining maximum production. In the five years, 1918-1923, the full-time annual capacity of the bituminous mines increased a quarter of a billion tons while production remained nearly stationary. With mines equipped and manned to produce a billion tons a year, the average production in the twenties was just half this figure. The result of such overdevelopment was operation much below capacity with the larger mines idle for one-third of the year, on the average, from 1890 to 1923. In the latter year these mines worked but 179 out of a working year of 308 days. The wagon mines and country banks were idle for much longer periods.

Attempts to establish order

The sickness of bituminous coal early became apparent and numerous attempts were made to diagnose and prescribe for the ailment.²⁷ As early as 1913 the coal operators themselves appealed to Congress to set up a coal commission to stabilize the industry by eliminating unfair competitive practices. Between 1913 and 1919 nineteen commissions and other investigations of the industry were conducted, of which a number focused attention especially upon the unhealthy competitive situation. Government intervention occurred during the First World War and in the years immediately following. The report in 1923 of the United States Coal Commission, set up as a result of the strike of 1922 to investigate the industry, brought the first of a series of proposals for remedying the sorry state of affairs, proposals that culminated in the Guffey Acts of 1935 and 1937 providing for the regulation of prices and competitive practices. Stability if not prosperity was in prospect.

²⁷ For a survey of the legislative and administrative history of the Federal regulation of the bituminous coal industry see Robert E. Cushman, *The Independent Regulatory Commissions*, pp. 368-389. New York: Oxford University Press, 1941.

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CHAPTER 22

Mass Production Since the War Between the States

What Is Mass Production?

"MASS PRODUCTION" has come to serve as a strikingly descriptive label for a type of industrial production that has attained full-blown proportions only in very recent years. It suggests perhaps more a trend in production than a simple, single, and clearly defined industrial process. The name itself, its catch-phrase character widely and favorably publicized, has caught the popular fancy, and has acquired a kind of broad social significance as a gather-all of many different connotations. It has come to be regarded as a distinctively American phenomenon, in which is embodied the essence of all past industrial achievement, and in which is contained the promise of all future industrial progress. It appears to supply the secret to the winning of modern wars and to the achievement of the great goals of economic prosperity and social well-being in peacetime.

Apart from the popular meanings that have been encrusted upon the label, the concept of mass production is undoubtedly a convenient one, insofar as it may provide a frame within which he who is rash may attempt to compress the complicated history of American industry, especially since the War Between the States. But what are the essential ingredients of this concept, and which of them can serve as a guide in telling the story of mass production? The first major ingredient would appear superficially to be the magnitude of industrial output. But magnitude is a relative factor; it is both a necessary condition of mass production and a measure of its effect, rather than its central core. Fundamentally and primarily, mass production relates to a method or to a body of methods and techniques developed in industry. Henry Ford early recognized this connotation in a definition credited to him: "Mass Production is the focussing upon a manufacturing project of the principles of power, accuracy, economy, system, continuity, and speed. . . . And the normal result is a productive organization that delivers in quantities a useful commodity of standard material, workmanship, and design at minimum cost."¹

¹ Quoted from an article by Henry Ford on "Mass Production," first published in the Thirteenth Edition of the *Encyclopaedia Britannica* (1926), Vol. II, p. 821. Mass production was also the subject of two monographs prepared by William Butterworth and Pierre Gounod respectively, dealing with its American and European aspects. Written under the auspices of the Europe-United States Committee

Such formal definition tends to abstract from reality and to simplify unduly the actual historical evolution of a complex process. Significantly, however, it points both to reduced production costs and to large volume of output as the principal effects and measures of mass production. Low cost, in particular, is the index of efficiency of mass production, and its main economic recommendation. It becomes socially important when lower production cost is translated into lower price, thereby broadening the market for that abundance of goods that is within its capacity. Other factors, outside the scope of mass-production technology, have, to be sure, combined to complicate and to obscure the actual trends of costs, prices, and total output. Among them have been certain restrictive tendencies in business organization and policy, as well as fluctuations of political and economic conditions that may have hampered the full realization of the social benefits inherent in mass production. Because of these restrictions and fluctuations, rather than because of any defect in an essentially neutral process, mass production has been associated with many modern social problems, chief among them being continuous employment and maintenance of full production through adequate mass consumption.

Basic Conditions of Mass Production

Three principal questions, all of them interrelated, are involved in the history of mass production as it developed in the United States during the modern period: namely, what made mass production possible; how was it achieved; and what have been its effects, insofar as they can be measured? It should be noted that although the principle germinated early it grew slowly and ripened late. This was because, in the actual historical process, the conditions that made mass production possible were not at the outset present in full force. They developed with and because of the progress of mass production, which thus generated its own conditions as well as new problems and continuing difficulties.

The evolution of mass production depended first upon the progress of technology and of invention, which, of course, determined the rate at which the machinery, the processes, and the very materials essential to mass production came into use. Second, the state of economy and business also exercised an important influence, since it determined the rate at which the requisite capital funds, the forms of business organization, and the skills of management were able to support the expanding structure of mass-production industry.

of the International Chamber of Commerce, these studies provided background material for an Industrial Congress held in Washington in 1931, and were published in the third volume of *Europe-United States of America*. Paris: International Chamber of Commerce, 1931.

A third set of conditions favoring the development of mass production had its source in the character of American society. That society was peculiarly congenial to the requirements and results of mass production both in a psychological and in a practical economic way. Quantitatively the home market was the chief factor in stimulating the expansion of industry generally and of mass production particularly. It was a market of growing proportions, as population increased more than fourfold between 1860 and 1940. A population soaring from 31,000,000 to more than 130,000,000 people during this period created demands for goods in constantly expanding volume and variety. This period, furthermore, witnessed an accelerated accumulation of capital, which equipped the country with the facilities for the production and distribution of an increasing stream of goods and services. A vast national market, moreover, was itself being created by the happy combination of improved means of communication and an internal system of free trade. The home market was also fostered by a spirit and policy of tariff protection for domestic manufactures, which had their source in the national needs and the growing industrial consciousness developed especially during and after the War Between the States. It should be noted, however, that already such early articles of mass production as firearms, agricultural and sewing machines, watches, and bicycles were able to tap foreign markets under competitive conditions, and evidently depended less upon tariff protection and more upon efficient production for their development.

Mass consumption was the chief support as it was the main condition of mass production, and provided both the material basis and the proof of a rising standard of living that became the distinctive badge of American society and the object of universal admiration and envy. The purchasing power of the American people, on an average per capita basis, increased nearly threefold between 1869 and 1929. In 1900 the per capita consumption of manufactures in the United States was estimated as being at least 50 per cent greater than that of Britain, and twice as great as that of Germany or France. By 1929, it had become a commonly held business opinion that "the wage earners . . . are the spenders of the nation, and upon their ability to spend freely the general business of our country depends."²

The American home market, in the words of Andrew Carnegie, was "a vast homogeneous market," and this factor, too, was a major development accompanying the evolution of mass production. Across the horizontal plane of its great geographical extent, as well as up and down the vertical social scale, the American market underwent a standardization of taste and consumption that bore profound psychological and

² D. D. Lescossier, and E. Brandeis, *History of Labor in the United States, 1896-1932*, p. 89. New York: The Macmillan Company, 1935. The growth of purchasing power is summarized in R. F. Martin, *National Income in the United States, 1799-1938*, p. 6. New York: National Industrial Conference Board, 1939.

economic significance. In part the demand for great quantities of identical or similar commodities was built up by the subtle suggestions of salesmanship and advertising that were a parallel and logical accompaniment of mass production itself. In part, too, such ready standardization of consumption was due to the scarcity of craft skills in a new country. The products of such skills had always figured prominently among American imports, which fell an easy victim to the convenient and cheaper standard products of machine industry.

This receptivity of standardized mass consumption to mass production was also a practical manifestation of that democratic equalitarianism that was distinctively, if not instinctively, American. Certainly it was a useful and powerful instrument of Americanization, by means of which men of widely different racial and cultural origins took on at least the superficial similarity of common tastes satisfied by the common goods of mass production. Whether and to what extent mass consumption and mass production contributed at one and the same time to the supposed stereotyping of the American way of life and to the growth of big business is, of course, a broad philosophical and cultural question more easily raised than answered. Equally broad and controversial are such questions as arise in connection with speed-up, monotony, fatigue, and other labor problems associated with mass production. Offering further material for speculation are the degree of rigidity inherent in the technological and economic structure of mass-production industry, and the relative facility with which it may be adapted to changing needs. New requirements tend to become pronounced in wartime, but they are also present in peacetime as the factors of demand change, or as the secular trends of population growth appear to decline and raise the spectre of a saturated or a contracting market. As early as 1877, David A. Wells, an outstanding economist of the time, asked a question that became familiar and characteristic in every succeeding period of depression: "What disposition is it proposed to make of the labor of the country which labor-saving machinery and new methods of business have now for the first time, and under existing conditions, made manifestly surplus?"³

Essential Elements of Mass Production

Whatever encouragement mass production received from the conditions and characteristics of the American market, the process itself evolved

³ D. A. Wells, "How Shall the Nation Regain Prosperity?" *North American Review*, July, 1877, No. 257, p. 126; also by the same author, *Recent Economic Changes*, p. 63 (New York: D. Appleton and Company, 1890). The same pessimistic note was echoed by Carroll D. Wright in his first report as United States Commissioner of Labor: *Industrial Depressions*, p. 257 (Washington, 1886). Compare, however, the prediction of an economy of abundance in Edward Atkinson, *The Industrial Progress of the Nation: Consumption Limited, Production Unlimited* (New York: G. P. Putnam's Sons, 1890).

gradually and haltingly from faint beginnings. The problem is, indeed, one of differentiating it from the general progress of industrial methods during the nineteenth century. Mechanization was, of course, the outstanding phenomenon of the Industrial Revolution, and is a basic part of the pattern of mass production. But mass production embraces, in addition, two other elements of major significance. One of them has been the principle of standardization. However crude its early form, standardization involved from the outset progressive attainment of uniformity of the products, the materials, the operations, and the very instruments or machinery employed in industry. Mechanization assured a more uniform result, but its own development was contingent upon the proper subdivision and standardization of the processes and components of production.

The pattern of mass production embodied still another basic element, which ultimately transcended the others. The progress of standardization and mechanization necessarily entailed the development of management, which, for the present purpose, may be defined as the art of planning, maintaining, and co-ordinating the component parts of large-scale production. Industrial management, in its function of assuring the smooth flow of planned production, became an essential requirement of mass production, just as specialized business management became a necessary adjunct of the large-scale corporate organization of business. In this connection it is significant to note that the American Society of Mechanical Engineers, founded in 1880, quickly broadened its interests from the technical problems of machine design and operation to include those of industrial management. In 1886, one of its members, Henry R. Towne, himself a founder of an early system of mass production in the manufacture of locks, addressed the Society on "The Engineer as Economist," proposing that the engineer must also learn to be a manager. In the next two decades the American Society of Mechanical Engineers became the first and principal forum for the discussion of the new art of management, then being fathered by Frederick W. Taylor and his associates. By its later and better publicized name, "scientific management" was thus a major contributor to the rapid development of mass production after 1910. With standardization and mechanization it constitutes the trinity of fundamentals of the modern pattern of mass production.

In a germinal form mass production made an early appearance on the American scene, almost coincidentally with the beginnings of industrialization proper. Its nucleus was the manufacture, applied first to guns and pistols, of interchangeable parts, which in turn imparted an impetus to the standardization and mechanization of the processes involved. This method of manufacture, early labeled the "American System," attracted European attention at the Crystal Palace Exposition

held in London in 1851. Several years later during the Crimean War, a British Government commission, including Sir Joseph Whitworth, a notable figure in the British machinery industry, visited the United States in order to observe and to report on the firearms industry. Subsequently orders were placed with New England gun and tool manufacturers for machinery to serve as a basis for the reorganization of the British industry on the American model.⁴

It is significant that the first American industry employing the interchangeable method acquired a foreign market at this early date. Here was a demonstration of the fact that the methods of quantity production, rather than tariff protection or even priority of invention, conferred upon the United States its chief advantage in competitive foreign trade. The War Between the States fostered a further expansion of the manufacture of firearms both in the Government arsenals and in the great private works. In the post-war period, especially during the depressed 1870's, the industry found a limited outlet for its products in increased exports to many foreign countries, including among others Spain, Egypt, Sweden, Denmark, and Japan.⁵ Both Turkey and Russia were armed with American-made rifles in the war of 1877. Prussia, too, turned to an American firm, Pratt & Whitney of Hartford, Connecticut, for the machinery with which to modernize her arsenals. The Prussian Government in 1875 acknowledged the merits of American machinery, remarking that it could "furnish the parts of the guns automatically, and with such precision of finish as to render them fit for the polishing process without hand work." It added that "the system upon which they are founded has rendered the government in no small degree independent of the skill and power of the workmen. In addition a very material economy has been obtained, amounting already to one-half of the wages formerly paid." ^{5a}

The Machine Tool Industry Before 1900

By the nature of its early development, the manufacture of firearms was closely connected with that of machine tools; the early gun shops, beginning with those of Whitney and North, were also machine shops in which the machine tools for this industry as well as for other types of metal work and woodwork were designed and made. During the greater part of the nineteenth century these shops were centered in New Eng-

⁴ For the beginnings of the manufacture of interchangeable parts, see Chapter 12, by Mrs. Constance Green. This topic received official recognition in a monograph prepared by Charles H. Fitch as a "Report on the Manufactures of Interchangeable Mechanism," in connection with the Census of 1880, and published in the second volume of the *Tenth Census* (Washington, 1883).

⁵ V. S. Clark, *History of Manufactures in the United States*, Vol. II, p. 312 (New York: McGraw-Hill Book Co., Inc., 1929).

^{5a} C. H. Fitch's "Report," p. 4.

land, as represented by the Colt Armory Company and Pratt & Whitney of Hartford, by Browne & Sharpe and the Providence Tool Company of Providence, and by Lawrence & Robbins at Windsor, Vermont. But the Middle States too had become the seat of an important machine-shop development by the time of the War Between the States. Outstanding were the great Philadelphia firm of William Sellers & Company, and shops in the Hudson and Mohawk Valleys. The stream of migration and industrial opportunity carried mechanics with their machine-shop skills from the East to new points in the West; by 1900, Cleveland, and particularly Cincinnati, had also become leading centers of the machine-tool industry, more than equaling those in the East.

By the time of the War Between the States and during the generation after it, the expanded facilities of the machine shops; especially those in New England, held a twofold significance for the evolution of mass-production methods. In the first place, facilities developed for the production of guns were extended to the manufacture of other metal products to which the principle of uniform interchangeable parts could be adapted. In the second place, such machine shops were able to advance the improvement of old and the design of new machine tools suitable for both general and special purposes in metal-working. Before 1900, indeed, a parting of the ways had occurred, and two lines of industrial evolution had sprung from the original general machine shops, each more highly specialized than was formerly the case. One of these was the machine-tool industry proper, while the other comprised the various special industries fabricating parts on a quantity basis and assembling them into finished metal products. Still a third development was the great expansion of the metal industries proper, especially those producing iron and steel, that supplied the essential materials for the manufacture of metal products. All three developments were closely dependent upon one another, and machine-tool manufacture, in particular, had emerged into prominence as the very foundation of mechanization. It provided the machinery and tools for the expanding technology of mass production, and, indeed, the "master tools" of all industry. Thus, by the 1890's, Pratt & Whitney, one of the early gun-making and machine shops located at Hartford, was advertising "complete plants . . . for Bicycle, Typewriter, Gun, and Sewing Machine Makers," as well as dies, gauges, and tools for general work, while the firm of William Sellers specialized in the equipment of heavy industry.

The contributions of the American machine shops, especially after 1850, to the development of machine tools were such as to place them in the same class as the English machine-builders who were generally acknowledged to be "the constructors of the world." In these shops was preserved an old tradition of mechanical craftsmanship that descended through a long line of mechanics. They, together with the long list of

machine tools that were the product of their ingenuity, comprise a genealogy of great complexity and cumulative historical significance. The American display of machinery at the Vienna International Exhibition of 1873 was, according to the contemporary reporter, "the richest in new forms of apparatus, and contained by far the most striking examples of the special adaptation of machines to peculiar varieties of work, and of what is commonly described as 'labor-saving machinery.'" The same writer observed that American machines enjoyed the dubious honor of imitation: "All other nations, as a rule simply presented copies of British and American machines. These were frequently announced as such, seemingly to secure confidence in their value. Corliss engines, tools marked *Système Sellers*, or copied from Browne and Sharpe, Pratt and Whitney, and others of our well-known mechanics were frequently met with."⁶

The achievement of the American machine-tool builders during this period consisted mainly in adapting the basic tools, which had a long English or European background, to the requirements of "the modern system of manufacturing." As an English observer noted in 1885: "The tools and processes which we are inclined to consider unusual are the commonplaces of American shops, and the determination to do nothing by hand which can be done by machinery is the chief characteristic." The lathe, the planer, the drill, and the borer assumed a multiplicity of form and were adapted to a variety of purposes in cutting and shaping metal. The "miller" was a distinctively American tool, originating with Eli Whitney, as was Blanchard's eccentric lathe for turning irregular shapes. Among major American innovations during the half-century after 1850 was the turret lathe, developed by Henry D. Stone, and consisting of a number of cutting tools fixed into a single head and applied to a metal part in successive order. By 1900 the turret lathe had been made automatic, thereby enabling one man to attend to a number of lathes. Gear-cutting too was made an automatic process, while as early as 1867 Sellers' "magnificent planing machine" was acclaimed by a jury at the Universal Paris Exposition "as well for its dimensions as for the novelty of its construction. . . . The guidance is perfect and most of its automatic transmissions are new and very efficacious."⁷

Accuracy of machine workmanship was, moreover, advanced, and much hand finishing eliminated by the development of the jigs and fixtures used to hold the parts in the machines. The improvement of measuring

⁶ R. H. Thurston, *Report on Machinery and Manufactures*, p. 11 (Washington, 1875). This is representative of a whole series of reports, in which United States Commissioners described their observations at the various international exhibits held during this period, such as those in Paris in 1867 and 1889, in Vienna in 1873, and the Centennial Exposition in Philadelphia in 1876.

⁷ F. A. P. Barnard, *Report on Machinery and Processes*, p. 239. New York; D. Van Nostrand Company, 1869.

devices for practical shop use, such as limit gauges, rules, and particularly the micrometer caliper designed by Brown & Sharpe in 1867, enabled the mechanic to achieve "accuracy to a thousandth of an inch." Automatic machine work was being brought into closer tolerances, and a growingly conscious movement for the standardization of commonly used parts was inaugurated as early as 1864, when William Sellers, while President of the Franklin Institute, sponsored a system of standard threads for screws, bolts, and nuts. Sellers' firm was also able to manufacture shafting to standard sizes in quantity, instead of to special order, as was formerly the practice.

Above all, machine tools increased in speed of operation, not only as they became more automatic in nature, but especially as they were adapted to multiple repetitive action. Simple repetitive processes such as drilling and punching were speeded up by means of the multiple drill and punch, with a number of spindles operating simultaneously. At the end of the century, one of the chief limitations upon the speed of machine-tool operation was set by the quality of the metal used in the cutting tools. By 1900, however, a long period of experimentation begun in the 1880's under the sponsorship of William Sellers had culminated successfully in the development of a new high-speed carbon tool-steel. This early venture in modern industrial research was the work of Frederick W. Taylor and Maunsell White. In connection with their experiments these men also undertook the first systematic study of the metal-cutting process, and their findings were published in 1906 in a revealing paper on "The Art of Cutting Metal." Thus was Taylor making significant contributions simultaneously to two related fields of modern engineering—machine tools and scientific management. Both were to play an increasingly prominent role in the phenomenal growth of mass production after 1900.

Industries on the Interchangeable System Before 1900

The machine tools newly developed in the half century before 1900 became a vital part of the equipment of American industry wherever machine-making and metal-working were undergoing expansion. But they bore a peculiarly close relation to the evolution of a number of new industries in which the system of interchangeable manufacture was employed. These industries attained considerable volume of output, especially after 1870, as they found large potential markets both at home and abroad. They became closely identified with the emerging concept of mass production, and their notable contribution to the standard of consumption helped to broaden its popular appeal and to facilitate its spread in industry generally.

Chief among the commodities produced according to the new technology were the sewing machine, agricultural machinery, the typewriter, and

the bicycle; while watches and clocks presented examples with a similar evolution but of a somewhat different character. Like the rifle and the pistol, development of which preceded them, these were relatively complex metal mechanisms that could best be assembled from uniform metal parts, and these parts could be manufactured with the same machine tools, in some cases even in the same shops. The sewing machine was one of the earliest and most important products of repetitive standardized manufacture. It reached the stage of practical industrial application by the 1850's, following the pivotal technical improvements made by Elias Howe, A. B. Wilson, and Isaac M. Singer. The expansion of the industry's output, however, occurred mainly after the War Between the States; annual production passed the half million mark during the depressed 1870's, and it approached the million mark by the close of the century, when American production was more than two-thirds of the total world output. Almost from the beginning a few leading American manufacturers accounted for the major part of the production both at home and abroad. In the early years they enjoyed the advantages of membership in a patent pool that dominated the industry until 1877. In 1876, for example, the Singer Company, with 262,000 machines, was responsible for more than half the total American output, while two other manufacturers produced more than 100,000 each. At the close of the century, the American factory of the Singer Company alone had a capacity of 11,000 machines per week, while its factory in Scotland employed 6,000 persons and manufactured 200,000 machines yearly.

The American sewing machine was popularized rapidly in American and foreign markets; in the 1870's annual exports averaged 50,000 and increased to nearly three times as many by the 1890's, in addition to the number produced in foreign branch factories. This popularization was due to new methods of distribution as well as to the new methods of large-scale production. Mass selling was promoted by the employment of agents and canvassers and by the development of an elaborate credit and installment system. The sewing machine, moreover, had important industrial uses as well as wide household application. It contributed to the mechanization and accelerated the growth of the ready-made clothing industry. In the case of boots and shoes, too, the sewing machine was a major factor in the process by which that industry during the latter part of the century was undergoing an elaborate subdivision and mechanization of operations, as a result of which it approached mass-production proportions. As early as 1861, the McKay sewing machine, and, after 1870, the Goodyear welt-sewing machine speeded up the manufacture of shoes, besides improving their quality.

Like the sewing machine, the machine-made watch became a distinctive product of American industry in the period following the War Between the States. It too was especially adaptable to the methods of

precision manufacture and interchangeable parts, and the machinery developed in this industry was a particularly important factor in the progress of automatic and multiple machine-tool technology of high precision. Two types of watches were represented in this evolution. The cheap brass watch, first manufactured in 1879 at Waterbury, Connecticut, was essentially an offshoot of the brass clock industry that had become well established in Connecticut in the generation before the War Between the States. But a watch of better quality, good enough to compete with the imported Swiss watch, was the product of an industrial venture started in 1850 by Aaron L. Dennison and Edward Howard, first at Roxbury, and after 1854, at Waltham, both near Boston. Technical and economic difficulties retarded progress for a decade, but the Waltham watchmaking enterprise began to prosper during the War Between the States. The new industry expanded rapidly thereafter, and rival ventures transported the new technology westward, especially to Illinois.

At the Centennial Exposition held in Philadelphia in 1876, the display of Waltham watches and of the precision machinery used in their manufacture won the grudging tribute of a Swiss observer. Noting that between 20,000 and 30,000 of these watches were being sold yearly in England, he announced: "I sincerely confess I have doubted this competition. But now I have seen—I have felt it—and I am terrified by the danger to which our industry is exposed." The efficiency of machine methods was indicated by the estimate that the American industry reached an average annual output of 150 watches per worker, approximately four times that of the Swiss worker. By the 1880's, the two principal firms, Waltham and Elgin, each employing nearly 2,000 persons, were manufacturing two-thirds of the total American output, while the Waltham Company exported one-third of its output. At the close of the century the Waltham factory was producing watches at the rate of 2,500 daily. The watch movement was described as a mechanical marvel consisting of 160 parts, and requiring 3,750 separate operations of manufacture and assembly.

Other products added prior to 1900 to the growing list of commodities, whose expanding market favored the successful adoption of machine methods of interchangeable manufacture, were agricultural machinery, the typewriter, and the bicycle. In the case of agricultural machinery, as in that of the sewing machine, quantity production was achieved early, not only through the progressive mechanization and standardization of processes, but also through the development of novel selling methods that facilitated the expansion of the market both at home and abroad. The industry acquired the characteristic features of large scale as well as large total volume of production. By 1890, two manufacturing plants located in Chicago alone accounted for 200,000 harvesting ma-

chines, while in 1898, the largest concern in the industry had an output of nearly 200,000 farm machines of all kinds. Moreover, aside from its extensive use of machinery for the fabrication of standard parts, it had introduced a system of conveyors on "little railways," thus providing an early example of mechanical transportation of materials and parts that was subsequently to revolutionize the methods of mass production.⁸

The major triumph of early mass production, however, was the bicycle, which reached the height of its popular vogue and its peak of production at about 1900, just as the automobile was emerging from its experimental into the industrial stage. Like the automobile at a later date, the bicycle commanded a large and devoted public, estimated at more than 4,000,000 persons in 1900; and it had become the nucleus of a broad cultural complex that reached out to a good-roads movement and to new habits of life and fashions in dress. The bicycle had been introduced into the United States from England as the curious product of a long process of European invention and improvement. Its manufacture in this country was begun in the 1870's, but the industry expanded rapidly only after the safety bicycle had been standardized by 1880. From the outset the industry was closely associated with the machine shops of New England, which made the tools for it, and which were often also converted to the manufacture of bicycles either in part or as a whole. By the close of the century the methods employed in the industry represented a high degree of standardization and mechanization, and bicycle factories were a special object of interest both for their machinery and their scale of operation. The industry, moreover, was one of the largest in the country, with an annual output of more than 1,000,000 bicycles. The American Bicycle Company of 1899, merging 56 plants into one of the principal industrial combinations of the period, was only some 20 years removed from the first factory established by Col. Albert Pope at Hartford, which had sold 92 bicycles in 1878. By contrast, the typewriter passed more slowly into the stage of large-scale industry, although it is noteworthy that successful production began in the 1870's, when the promoters of the Sholes machine arranged for its manufacture by the Remington Company, a gun and machine shop in central New York State.

Other industries also displayed the characteristics of a rudimentary

⁸ N. S. B. Gras, and H. M. Larson, *Casebook in American Business History*, p. 713 (New York: F. S. Crofts & Co., 1939). On industrial evolution before 1900, consult the second volume of Clark's *History of Manufactures*; also C. H. Cochrane, *Wonders of Modern Mechanism* (Philadelphia: J. B. Lippincott Company, 1895); C. M. Depew, editor, *One Hundred Years of American Commerce* (New York: D. O. Haynes & Company, 1895); E. W. Byrn, *The Progress of Invention in the Nineteenth Century* (New York: Munn & Company, 1900); and F. W. Wile, editor, *A Century of Industrial Progress* (New York: Doubleday, Doran & Company, 1928).

mass production in the generation following the War Between the States. Basic food industries, such as flour milling, meat packing, and canning, expanded in scale and size as a result of both technical progress and the broadening of markets by improved transportation. Food canning, in particular, received an impetus during the 1870's, with the development of large-scale pressure cooking, and of the Howe machine for the automatic sealing of cans. The tin can was, moreover, an important early manifestation of the modern technique of packaging, which was to contribute so greatly to the cleanliness of the product and the convenience of mass consumption. It was an index to new methods of salesmanship and marketing, as well as to a rising standard of living. The development of automatic packaging, both for metal and for paper and cardboard containers, began in the 1870's, and became an important feature of the technology of mass production, especially in the consumers' goods industries, such as foods and tobacco.

Measures of Mass Production Since 1900

Mass production in its germinal form and in some of its methods had made its appearance in American industry by 1900. Its extent and effect were, however, limited and obscured by the dominant and prevailing pattern of small-scale industry. After 1900 the diffusion of mass production was more general and its evolution more spectacular, as it gained headway under the favorable influences of expanding markets, progressive technology, and more advanced forms of business organization and management. The available statistical data also become more ample and adequate for an over-all measurement of its expanding scope and effect. But the importance of the development of mass production after 1900, as before, still lies in the methods and techniques by which it was attained, rather than in any measures of its results.

From the statistical standpoint, certain aspects of the growth of American industry since 1900 in particular illustrate and reflect the broad trend toward mass production. For example, the total volume of industrial output and the productivity of labor both increased considerably faster than did the population or the number of industrial establishments. Thus, between 1899 and 1937, the growth of population was approximately 73 per cent; the physical volume of manufactures, however, increased by 276 per cent. While the number of wage earners employed in manufacturing nearly doubled in the same period, industrial output rose almost fourfold. If allowance is made for the shortened working week, the productivity of labor, on a comparable man-hour basis, at least doubled during this period. The number of industrial establishments showed little change, indicating a trend toward greater plant size. In 1899, the census reported 205,237 plants with an annual output of \$500 or more, while in 1937 there were only 166,794 establish-

ments with a production valued at \$5,000 or more. Even among these, the plants that employed 250 or more workers constituted in 1937 less than 4 per cent of the total number of establishments, but they accounted for 55 per cent of all wage earners in industry. On the basis of the gross value of their annual output, amounting to \$1,000,000 or more, the larger plants made an equally impressive showing. Totalling 6 per cent of all industrial establishments, they were responsible for 70 per cent of the gross value of industrial production.⁹

Such indices of the scale and size of manufacturing output, to be sure, offer only a general presumption of and clue to the development of mass production. A similar presumption arises with respect to the process of industrial integration and consolidation that was another significant phenomenon of this period. The motives, the methods, and the controversy concerning the merits of the combination movement fall outside the scope of the theme of mass production in its strictly technical sense; it has even been argued that mass production is primarily "a matter of internal arrangements and economies within a single plant. It is technical, . . . not financial or commercial."¹⁰ Nevertheless, the progress of consolidation was correlated with the trend toward large volume and scale of industrial output, and the plants thus brought under central-office ownership or control were peculiarly representative of the trend toward mass production. Thus, by 1937 there were 5,625 such multiple-plant, central-office concerns combining 25,699 industrial establishments, or about one-seventh of the total number of establishments in the United States. Their share of the nation's manufacturing output was more than three-fifths, and they employed more than half of all wage earners in industry. It was estimated, moreover, that the average central-office plant produced seven times as much in net value of output as the average independent plant, while its productivity was approximately 20 per cent greater per worker than that of individual establishments. The parallel between mass production and what might be called mass organization in industry was further emphasized by the fact that in 1937 the 50 largest manufacturing concerns controlled the operations of 2,869 plants. Embracing less than two per cent of all establishments,

⁹ Statistical data measuring major industrial trends are given abundantly in the *Statistical Abstract of the United States* (1941), and also in Solomon Fabricant, *The Output of Manufacturing Industries, 1859-1937* (New York: National Bureau of Economic Research, 1940); F. C. Mills, *Economic Tendencies in the United States* (New York: National Bureau of Economic Research, 1932); *Machinery, Employment, and Purchasing Power* (New York: National Industrial Conference Board, Inc., 1936); and especially in the monograph *Technology in Our Economy*, No. 22 in the series prepared in connection with the investigation of concentration of economic power by the Temporary National Economic Committee (Washington, 1941).

¹⁰ Quoted in *The Relative Efficiency of Large, Medium-Sized, and Small Business*, Monograph No. 13 of the T.N.E.C. Series on Concentration of Economic Power, p. 95. Washington, 1941.

they employed nearly one-sixth of all wage earners, and the gross value of their output was one-fourth of the total. This small group of large concerns represented diversification as well as concentration of industrial production, since they accounted for a large proportion of the manufacture of more than 2,000 commodities out of the 4,000 items listed in the Census of Manufactures.¹¹

The parallel trends toward concentration and mass production varied in intensity with the type of industry. On the whole, they were most prominent in industries that had a large and relatively constant and uniform market demand. From the technical standpoint, too, the methods of mass production were best adapted to two kinds of industry. These were, in the first place, the heavy industries in which large masses of materials could be handled in a continuous and almost automatic sequence of processes, as was the case with iron and steel, paper, cement, and a growing number of chemical manufactures. But mass production was also suited to those industries that produced finished and relatively complex commodities in quantity by means of a consecutive and co-ordinated series of standardized operations, as represented by an expanding list of household and business appliances, and particularly by the automobile. Mass-production methods were of an infinite variety, and their effect was cumulative. Essentially, however, they were of two principal kinds. There were, in the first place, mechanical methods that entailed the increased use of machinery and power wherever standardization and the subdivision of processes were sufficiently advanced. But of equal importance were nonmechanical or organizational elements that effected a better control and a more efficient utilization of the materials, machinery, and manpower engaged in production. In general terms, the earmarks of mass-production technology were more plant, more machinery, and more power in industry, as illustrated by the fact that the average capital investment for every wage earner employed in industry had risen to \$7,000 by 1937. But another contributing factor was "more management per man as well." The ultimate objective of mass production was, as Henry Ford phrased it, "the planned orderly progression of the commodity through the shop."¹²

Mechanization and Machine Tools After 1900

Basic to the progress of mass-production technology, after as before 1900, was the development of the machine-making industries, which had

¹¹ *The Structure of Industry*, Monograph No. 27 of the T.N.E.C. Series on Concentration of Economic Power, pp. 111, 141, 583 ff. Washington, 1941.

¹² For the essential characteristics of mass-production technology, see, in addition to Ford's article in the *Encyclopaedia Britannica*, H. S. Person, ed., *Scientific Management in American Industry*, p. 38 (New York: Harper and Brothers, 1929); also Harry Jerome, *Mechanization in Industry*, pp. 27 ff. (New York: National Bureau of Economic Research, 1934); and *Recent Economic Changes*, especially Volume II, pp. 495 ff. (New York: McGraw-Hill Book Company, 1929).

their beginnings in the machine shops of the nineteenth century. By 1899 this group of industries, including the manufacture of power machinery as well as of machine tools and other forms of machinery, was already of considerable size, employing more than 400,000 persons, or nearly 9 per cent (8.8 per cent) of all industrial workers. By 1929 it employed more than 1,000,000, or about one-eighth of all wage earners in industry. The machine-tool branch of this industrial group was especially important in the evolution of mass-production technology, for it not only provided the standard tools of all machine making generally, but it contributed in particular the highly specialized and diversified mechanical equipment necessary for the manufacture and assembly of interchangeable parts in the metal-products industries. These were still in the forefront of the development of mass production, as they had been in the nineteenth century. It is significant that by 1940 the fabricated metal-products industries required about a third of all the machine tools then in use in the country, while the automotive industry alone employed an additional seventh of the total. The metal-cutting machine tools by themselves constituted, moreover, some 70 per cent of the metal-working machines of all kinds employed in American industry.

In the period after 1900, machine tools were given an infinite variety of size and shape, ranging from general and standard to special-purpose types. The special-purpose tools took on particular importance in proportion as an anticipated large quantity output of uniform metal products justified them economically. Machine-tool design and development, furthermore, displayed certain significant trends that greatly augmented the speed and precision of operation. The development of automatic machines of multiple character, such as the turret lathe or the multiple drill, begun before 1900, culminated in the multiple-station machine tool, a type that was really several machines combined into one, performing successive cutting processes and operating simultaneously on a number of identical parts. Fixtures, jigs, and dies of increasing complexity and variety facilitated the application of the machine tools to the requirements of industry.

A primary contribution to increased speed of operation resulted from the continuous improvement of the metals used both in and with the machine tools. Higher standardization and reliability of metals caused fewer interruptions of work and required fewer adjustments of tools. Another major cause of increased speed lay in the improved quality and cutting power of the new tool-metals used. For example, the introduction of the Taylor-White high-speed carbon tool-steel after 1900 more than doubled the productivity of the machine tool. After 1910 came the use of molybdenum, tantalum, and tungsten-steel alloys, supplemented later by nonferrous compounds, chief among them tungsten carbide, which was introduced from Germany after 1928. It was esti-

mated that the cutting tools of 1940, made from the new cutting-tool metals, had a productivity 9 to 14 times that of the machines of 1900. Moreover, greater precision of work was achieved as finer tools were employed, and as grinding, honing, and lapping processes made possible high finishes and minutely close tolerances. Measurement to a high degree of accuracy also was achieved by means of improved gauges and other measuring instruments, which became increasingly automatic and self-recording. The Johansson blocks, introduced from Sweden by Henry Ford in the 1920's, brought the precision measurements of the laboratory into the factory for the multiple purposes required by precision manufacture.

The machine tools were further improved in power and speed of operation in proportion as the electric motor came into common use after 1900. A power unit of proper size could now be incorporated into the machine, which thereby acquired greater flexibility and individuality, as well as the advantages of closer control and better synchronization of operations. One of the most significant applications of electrical power was to portable hand tools, which added greatly to the speed and convenience of assembly operations. The flexible and multiple utility of electricity, as applied to instruments, also facilitated the frequent inspection and automatic testing of parts for size, quality, and performance. Electricity, furthermore, made possible a significant improvement in the character of metal-working operations, thereby expediting the assembly of metal parts. Electrical welding was invented before 1900 by Elihu Thomson, one of the founders of the American electrical industry, but its large-scale application to the metal industries dated largely from the 1930's. Spot- and seam-welding was made automatic and rapid, displacing many operations that formerly had involved riveting and bolting individually and by hand. One of the major developments in metal working of special importance to the manufacture of the automobile and similar metal products was, in fact, the very considerable shift from metal cutting to other methods of fabrication calling for different kinds of machines. The increased use of sheet metal permitted the introduction of pressing, stamping, and punching machines that tended, therefore, to supplant or to supplement the machine tools at many points. The newer operations were simpler and required less skill; they could be made more fully automatic and continuous in action.¹³

¹³ Recent trends in machine-tool evolution are surveyed in *Technology in Our Economy*; *The Machine Tool Industry*, and *The Aviation Industry*. New York: George S. Armstrong and Co., 1941. As an example of the ultimate in automatic machinery, developed by the A. O. Smith Company of Milwaukee for the mass fabrication of automobile bodies, note the boastful title of an article by L. R. Smith, "We Build a Plant to Run Without Men," published in 1929 and cited in Jerome, *Mechanization in Industry*, p. 398.

The Progressive System of Assembly

The development of mechanical equipment facilitated and accelerated the repetitive processes involved in the manufacture of uniform parts, and it also affected other phases of industrial production. The assembly of parts into the finished product was a particularly critical process in the complex metal-products industries; it entailed much manual labor in the handling and fitting of parts, as well as relatively large inventories of stock. The full realization of mass production, therefore, hinged upon a proper solution of this problem. Its disposal, however, demanded more than technical or mechanical improvements; it was a broad problem of management and control and co-ordination of production belonging primarily to the nonmechanical aspect of mass-production technology.

In supplying that control and co-ordination the automobile industry became peculiarly important in the evolution of mass production; its history in fact epitomizes the triumph of mass production in the United States. European in its original conception and early experimentation, the automobile entered the stage of practical industrial development in the United States during the 1890's. By 1900 the new industry had received recognition, and the Census of that year credited it with an output of about 4,000 cars valued at just under \$5,000,000. In this stage of the industry, manufacturing ventures were numerous, small, and hazardous. It was the period in which the storage battery and electric motor, the steam engine, and the gasoline engine were competing for place as the power unit of the new type of land conveyance. By 1910 the automobile industry had won an established position as an important new industry, with an output of 187,000 cars valued at more than \$200,000,000.

In the next decade, 1910-1920, the industry completed the transition to mass production, the full fruits of which were to become apparent in the prosperous 1920's. It was perhaps the most important symptom and proof of that prosperity. In statistical terms, the output of the industry passed the half-million unit mark in 1914, and the million mark in 1916. By the close of the First World War, in 1919, production was nearly 2,000,000 cars, and the all-time peak was reached in 1929, when more than 5,500,000 cars and trucks were produced for both domestic and foreign markets. It had become the largest single industry in the country in the value of its product, as well as the chief stimulus to a host of ancillary industries, and the model of modern mass production.

In the automobile industry, as in other industries, mass consumption and mass production were linked together through new methods of advertising and salesmanship, as well as through the economies of production, that by 1929 were estimated to have reduced the labor cost of the car to one-sixth of what it had been in 1900. During the 1920's, the automobile industry even showed that it could defy a basic condition of

mass production; it witnessed an upward trend in design and manufacture that raised the automobile to standards of comfort and esthetic appeal far beyond the simple essentials of a mass-consumption utility. According to one commentator, the industry now also tried to surmount the critical problem of market saturation that tends ultimately to confront mass production, especially in the durable-goods field: "Wear alone made replacement too slow for the needs of American industry. And so . . . business elected a new god to take its place along with . . . other household gods. Obsolescence was made supreme. It could be created almost as fast as the turn of the calendar."¹⁴

The automobile industry began its evolution with the system of interchangeable manufacture developed in the previous century as the established procedure in the manufacture of sewing machines, farm and business machinery, and bicycles. To a considerable degree the early manufacturers of the automobile were merely assemblers of ready-made parts, and employed the facilities of the existing machine shops in New England and in the Middle West, as well as of special factories engaged in the production of the necessary parts. This division of labor in itself tended to emphasize a program of standardization and simplification that was sponsored early by the Society of Automotive Engineers, founded in 1905. The scale of operations possible under the prevailing conditions of production, price, and market was expanding steadily. In 1905 the Olds Motor Vehicle Company claimed to have the largest plant in the industry, and an annual output of 6,500 cars. In 1909, the Ford Motor Company, in operation since 1903, attained a production of more than 18,000 cars, but by 1913 this company had a daily capacity of 1,000 cars, and an annual production of more than 250,000 cars, or nearly half of the total output of the industry as a whole. Its new Highland Park Plant, near Detroit, employed 15,000 persons and was described at the time as the "most interesting metal-working establishment in the world."¹⁵

What made this plant significant was not alone its large size and newness, but rather the fact that it had become the seat of a major industrial experiment, out of which came a tremendous advance in mass-production

¹⁴ P. M. Mazur, *American Prosperity*, p. 92. New York: The Viking Press, 1928. On the development of quality and design in mass-production industry, see *Annals of the American Academy of Political and Social Science*, Vol. 149 (May, 1930), pp. 28 ff.; and S. and M. Cheney, *Art and the Machine*. New York: McGraw-Hill Book Company, 1936.

¹⁵ In 1914, the Ford plant served as the theme of a series of articles in the *Engineering Magazine*, by H. L. Arnold and F. L. Faurote, also published in separate form as *Ford Methods and Ford Shops*. (New York: Engineering Magazine Co., 1915.) In 1936, the still greater River Rouge plant was the subject of a similar series of articles in *Mill and Factory*, by H. W. Barclay, also published separately as *Ford Production Methods*. (New York: Harper and Brothers, 1936.) Aside from a certain quality of overeloquent zeal, both of these volumes give perhaps the best available specific portrayal of mass-production technology in its early and advanced stages, as developed in its modern form.

technology. The initial step had been taken as far back as 1908, when Henry Ford emerged from the general background of the automobile industry with its many pioneer figures, and assumed a distinctive role in its subsequent evolution. The cue to this role was the manufacture of a single type of car, the market for which was expanded by the progressive reduction of price. This famous Model-T was continued without serious modification up to 1927; until new standards of market demand compelled a drastic change to an entirely new model, more than 15,000,000 Model-T cars had been manufactured in less than 20 years, during which the base price had been reduced from \$950 to a low point of \$290 in 1924.

The expanding volume of production of a single standardized commodity, such as the Model-T car, offered, of course, enormous possibilities for the design and use of specialized machinery, dies, and patterns, and for the subdivision of labor to a high degree. The major advance was made, however, between 1913 and 1914, when the process of assembling the parts at the Ford plant was reorganized on novel and revolutionary principles. Down to this time assembly was of a stationary type; at the Ford plant there were 100 of these stations for the major chassis assembly, at each of which five workers served as assemblers, while others brought up the necessary parts. Component parts were assembled in the same manner by workers operating individually or in teams at fixed stations. During 1913 experiments were begun with some of the minor assemblies and in 1914 were extended to the assembly of the chassis, motor, and body proper, with astounding economies in time and labor. The required time for a chassis assembly, for example, was reduced from 14 to 2 man-hours. The essential principle of the new methods of assembly was to deliver the work to the workers, each of whom was given a specialized part of the job and kept constantly occupied with that alone. The result was a progressive line of assembly in which a system of power-driven conveyors carried the work at the right speed and level for the workers stationed alongside. The rudimentary idea of mechanized conveyors was not new; it had been applied before 1900 in the processing of cattle and hogs, and conveyors had indeed been a part of Oliver Evans' flour-milling machinery as far back as 1791. Mechanical conveyors came into general use during the latter part of the nineteenth century, mainly, however, for the handling of materials in bulk, especially in loading and unloading.

In the Ford system of production power-driven conveyors were incorporated as an integral and vital part of a new type of "continuous-flow production"; this innovation in turn had an impact upon the whole manufacturing process, involving a more elaborate division of labor and a rearrangement of machinery in the plant layout.¹⁶ The essence of the

¹⁶ See the article on "Revolution in Mass Production" in *Fortune*, Vol. XXVII, (Feb. 1943), pp. 131 ff.

new system of manufacture was, in fact, a type of industrial engineering extending its control over all phases of production. With emphasis on the orderly flow of work, the processes had first to be analyzed and standardized, and the necessary machinery had to be set up and arranged in proper functional order, rather than by separate departments. Thereby was effected a saving of time and labor previously consumed in crisscross transportation of materials and parts, as well as in the storage of surplus inventory. As early as 1914, Ford's principle of "progressive production" was hailed as an "ultimate achievement," but it received an even more impressive demonstration after 1920 in the completion of the River Rouge plant, which almost literally converted coal, iron ore, and other materials into a finished automobile by a consecutive and continuous series of processes centered at a single site. The Ford methods were, moreover, given early emphasis and publicity by the proclamation in 1914 of a novel and ostensibly liberal labor policy, in the form of a voluntary reduction of working hours from 9 to 8 per day and the establishment of a minimum daily wage of \$5 for all Ford workers. Aside from its practical purpose of winning labor support for the speed-up of the new methods, it had broader social significance in linking this model example of mass production with a philosophy of high wages.

Mass Production Spreads

The period following the First World War was a fertile one in the extension and adaptation to a host of industries of the expanded concept of mass production, with its system of progressive production. The advantages of the system were particularly apparent in new types of durable consumers' goods, such as the radio, the mechanical refrigerator, and other household appliances, besides other commodities of smaller bulk and value, such as machine-made and -packaged foods, cigars, and cigarettes, and indeed all articles capable of being standardized for an expanding consumer market. Under the pressure of falling prices, mass-production technology continued to develop during the depression of the 1930's and its effect on labor displacement became an object of special study and concern. Its continued vigor as a dominating principle of American industry was further demonstrated when the demands of national defense and war grew increasingly urgent after 1939. Mass production now presented new possibilities, but it also faced new problems and difficulties as large-scale conversion of existing mass-production industries to the manufacture of war goods was undertaken as a matter of national policy. The conditions and requirements of war provided crucial tests for the "know-how" that was one of the major assets of the mass-production industries, as well as for the elasticity and adaptability of their accumulated and highly specialized equipment and organization. The expanding aircraft industry and even shipbuilding became peculiarly

significant proving-grounds for mass-production technology in its latest form.¹⁷

In the period after 1900, another group of industries also achieved mass production by means of continuous and increasingly automatic processes of manufacture. This group included in particular products possessing the joint characteristics of large volume of output and a high degree of uniformity; it embraced the great material-producing industries. Steel, paper, cement, and glass were outstanding examples of this type, while many of the new and rapidly growing chemical industries, also in this category, were specially adapted to quantity production by continuous processes. In paper making the Fourdrinier machine had introduced the continuous method of production during the nineteenth century, but its speed of operation was greatly increased after 1900, and the equipment for preparing the raw material also grew in size and scale of operation. After 1890, the rotary kiln of constantly increasing size made possible the continuous and automatic production of cement. Steel making too was transformed into a continuous process, extending from blast furnace to converter, open hearth, and rolling mill. This technology of continuous large-scale processing culminated in the introduction in 1927 of the continuous strip-sheet steel-rolling mill, operating at high speed.

One of the major triumphs of the continuous and automatic principle in mass production occurred between 1903 and 1917 in the glass-making industry. As late as 1900 this process was largely nonmechanical and employed skilled blowers both for flat glass and glassware. In 1903 the first machine was introduced for mechanical glass blowing, and in 1917 the continuous flat-glass process was perfected both for window and plate glass. In the same period machine blowing was developed for the manufacture of glassware; after 1917 the Owens automatic machine, with a conveyor "feed and flow," dispensed with six out of every seven workers, leaving only one semiskilled operator to supervise the process. One of the chief applications of automatic glass blowing was to the electric bulb industry. The phenomenal expansion of output in this field was further advanced by the simplification and standardization of the product to a few sizes and types and to a single voltage rating.

Accompaniments of Mass-Production Economy

The evolution of mass production, especially in the period since 1900, cannot be told exclusively in terms of technical advances and labor-saving inventions. Three accompanying developments in particular bear

¹⁷ Recent trends in the development of mass production are surveyed in the T.N.E.C. study, *Technology in Our Economy*. For the influence of the Second World War, see the article on "Increasing Productivity and Technological Improvements in Defence Industries," *Monthly Labor Review*, Vol. 54, (Jan., 1942), pp. 34 ff.; also *The Transactions of the Society of Automotive Engineers*, Vol. 36, (June, 1941), pp. 218 ff.; and *The Aviation Industry*.

a close relation to mass production, and form an integral part of the pattern of the industrial society in which it has flourished. They are the movements toward standardization, industrial research, and scientific or industrial management. All three developments had their modest beginnings before 1900, but they assumed importance chiefly after this date. Research filled a prominent place in the business career of George Eastman, whose own spare-time researches laid the groundwork during the 1880's of an industry for the manufacture of photographic film and the Kodak camera, characterized almost from the outset by "large-scale production at low cost for a world market, backed by scientific research and extensive advertising." The role of research in industry was demonstrated still more spectacularly by the establishment of Thomas Edison's laboratory at Menlo Park, New Jersey, in 1878, and by the development of its first major product, the improved electric light. At the turn of the present century, the research laboratory became an integral part of industry, as represented by the examples of the General Electric and the American Telegraph & Telephone companies. Systematic industrial research facilitated, in the words of C. F. Kettering, himself an outstanding figure in this field in the automobile industry, "the transition . . . from the individual as an inventor to the group as an inventor. . . ." ¹⁸ Both standardization and industrial research received public recognition with the establishment of the Federal Bureau of Standards in 1901, and of the American Testing Society in 1902, for the "Promotion of Knowledge of the Materials of Engineering and the Standardization of Specifications and Methods of Testing."

The First World War gave an immediate practical, as well as a broader political and social significance to the movements for standardization, industrial research, and scientific management. A Conservation Division was set up under the War Industries Board in 1918, "in order to reduce needless activities." It issued orders and regulations restricting and standardizing the varieties of goods to be manufactured. The Research Division of the Chemical Warfare Service pooled the resources of both Government and industry for the promotion of research. Nor were these activities allowed to lapse after the war. The National Research Council, founded in 1916, made periodic surveys of this expanding activity in the following years. Between 1921 and 1938, it reported a fourfold increase in the number of companies engaged in research and a fivefold increase in the personnel thus employed, with a total employment in 1938 of nearly 50,000 persons, and an annual expenditure of approximately \$200,000,000. Standardization, too, was

¹⁸ *Technology in Our Economy*, p. 211; see also C. W. Ackerman, *George Eastman*, pp. XIV, 31 (Boston: Houghton Mifflin Company, 1930); *Twenty-Five Years of Chemical Engineering Progress* (American Institute of Chemical Engineers, 1933), pp. 4 ff.

fostered under the official sponsorship of Herbert Hoover, an engineer by training and Secretary of Commerce during the 1920's. In 1922 a Division of Simplified Practice set up in this Department launched a program of conferences and collaboration with various trade associations, looking toward the further standardization of practices and products.

During this prosperous decade the nation indeed became efficiency-conscious and mass-production-conscious. There were "Management Weeks" and Management Conferences. In the continued progress of management and mass-production technology was found the much-publicized promise of permanent prosperity. Unfortunately the onset of depression in 1929, just after Herbert Hoover had assumed the office of the Presidency, brought disillusionment and frustration, and raised the problem of bringing mass production into better balance with mass consumption. In 1937, while some were looking to national planning as a remedy, Walter P. Chrysler offered no new solution, but reaffirmed faith in the benefits of mass production as the result of pooled intelligence: "Steady improvement, of course, has been the fruit of inventive minds like Kettering, . . . but to support a Kettering there must be other kinds of minds, those of production men, of merchants, of mechanics, of advertising men, and countless others. When all these minds, through organization, are made to function as a single intelligence, why, then, you can expect to produce magic."¹⁹

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¹⁹ Quoted from Boyden Sparkes, "Life of an American Workman," *Saturday Evening Post*, August 7, 1937, p. 20. See also "Fifty Years of Mechanical Engineering," *Mechanical Engineering*, Vol. 52, (April, 1930), pp. 402, 451.

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CHAPTER 23

Development of a National System of Transportation

THE YEAR 1870 found the country with a well-formed network of railroads east of the Mississippi and north of Washington and the Ohio River. Two-thirds of the railroad mileage ultimately to be in New England was in operation, as was nearly one-half of that in New York, Pennsylvania, Ohio, and Indiana. Through railroad routes extended from Boston to the West, *via* Canada, or *via* Albany and New York State. New York City was connected with Chicago by railroads operating over the present routes of the New York Central and the Pennsylvania. The Erie and the combination of the Central of New Jersey and the Baltimore & Ohio furnished additional service as far west as Ohio.

The railroads of the South were still far from complete. While local lines connecting the Atlantic ports to the hinterland were well developed and had served military needs during the war, the present-day through north-and-south routes of the Southern, the Atlantic Coast Line, and the Seaboard Airline east of the Appalachians were hardly in evidence. In this area coastwise water carriers still moved a sizable amount of traffic. In the interior, however, the Louisville & Nashville had pushed as far south as Decatur, Alabama; while the Nashville, Chattanooga & St. Louis had a connection with Atlanta. The one through line from the large cities of the East came from Roanoke diagonally through the mountains to Knoxville and Chattanooga along the present route of the Norfolk & Western and the Southern railways. North and south in the Mississippi Valley there was only a partially completed route, for here again the water carriers were dominant, and the bridging of the lower Ohio offered engineering difficulties.

In the West a number of railroads had been built across Illinois and southern Wisconsin; a few had pushed west to the Missouri River, and one extended north through Wisconsin to Minneapolis. Although the Mississippi River had been first bridged, in 1856, at Rock Island, it was not until 1865 that a second bridge was built at Clinton, and not until just before 1870 that bridging was general. The Missouri River was yet to be bridged. The Union Pacific alone had pushed beyond and crossed the continent to the Pacific. In the Southwest, one line reached from the Mississippi across into Arkansas, and another in Louisiana extended toward the eastern edge of Texas. As for the remainder of

the West, there were a few short lines in operation, such as those radiating from Galveston and from Houston in Texas, and those in the San Francisco Bay area.

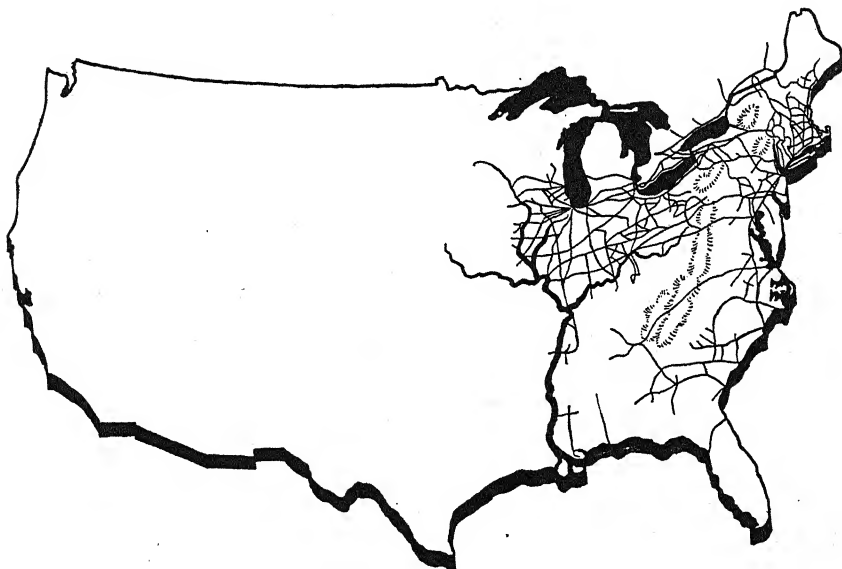


FIG. 1. The Railroad System About 1860.

In total there were about 53,000 miles of railroad in the entire country, nearly four-fifths of which was east of the Mississippi River. The water-transportation system of the country still occupied a position of great importance. Coastwise lines in the East still handled the major part of the freight moving north and south. Rockland, Portland, and Bath, Maine, were connected to Boston by boat. The traffic between southern New England and New York moved to a large extent through Long Island Sound, on the numerous boat lines that connected New York City with each of the important southern New England ports. To the south, New York City was connected to Baltimore, Richmond, Norfolk, Charleston, Savannah, and other ports by frequent steamship service. These ports, in turn, were joined with the interior by rail. Inland water transportation had not decreased in magnitude, even though its proportion of the total was lessened. One-half of the western grain movement coming east on the northern route was moving over the Erie Canal; one-third of St. Louis' commerce was moving on the Mississippi River.

The country's highways were in a stagnant state, having been left to the various local government agencies after the promotional phases of the turnpike and plank-road companies of the earlier period. Highway traffic was of a local character and its economic significance was overshadowed by the interest in railroad developments.

Railroads

For the next four decades after 1870, the development of railroad transportation was to be the country's most dramatic enterprise. Rapid technological progress was made in the physical tools with which the railroad companies operated. New sections of the country were to be opened up, and older ones provided with a more intensive coverage by extension of railroad lines. The financial phases of the economy, both private and governmental, were to be profoundly influenced by the methods and tactics of railroad promoters and manipulators. The whole economy was to feel the impact of changing levels of rates as well as changing relations between particular rates. The problems arising in the course of all this activity were to lead to a restriction of the railroad companies' private position, and the imposition of some degree of Government controls. At the end of the four decades, the period of extensive development would be over, the field for the promoter would be gone, and the methods of the manipulator and operator would be less rough and rapacious, with the Government taking a hand in restricting some of their more harmful actions.

Technological developments in the railroads

The decade from 1860 to 1870 had witnessed the introduction of a series of innovations that provided great opportunities for increasing railroad efficiency. In the early 1860's steel rails were brought from England, and shortly after they were rolled in this country as a result of the development of the Bessemer process for making steel. Iron rails had proved to be a weak spot in railroad operation because the needed increases in speed and load were beyond the strength of iron rails. Further progress in response to those needs would have been limited if new material for rails had not been developed. Simultaneously steel was finding its place in locomotive construction, steel driving-wheel rims, steel fireboxes, and whole steel boilers being first tried in the sixties. Larger boilers, longer frames, and generally increased size of locomotives soon developed. One of the leading innovators in this field was Alexander X. Mitchell, the master mechanic of a Lehigh Valley Railroad subsidiary, who was pushing forward in the design of larger locomotives for cheaper operation over the heavy gradients that his railroad had to surmount in hauling anthracite coal to markets. In 1866 the first locomotive with eight coupled driving wheels and a two-wheel guiding truck was built to his design. A year later his ten-driving-wheel locomotive appeared;¹ but, like the one built on the Central Pacific shortly after

¹ Alexander Mitchell was one of those little-heard-of figures, who, as an ingenious mechanic, responded constructively to the needs apparent in his environment. He had the good fortune to develop something almost immediately acceptable to his

for the heavy grades of the Sierras, it was ahead of its time. The first of these locomotives was called the "Consolidation," which became the type-name for a class of heavy freight engines, the use of which spread widely over the country during the next 40 years. The urge to develop such increased pulling power as these locomotives represented was a definite response on the part of aggressive personalities to the particular handicaps that they faced.

The basic technological development of the railroads continued in the direction of stronger, heavier rails and larger locomotives with higher boiler pressures and with increased wheel loads, all made possible by improved rails. This improvement was to lead to heavy freight train loads. In 1868 maximum steel rail weights were 65 to 67 pounds per yard; while three pairs of driving wheels with the loads per axle approaching 20,000 pounds represented the most advanced locomotive size. This axle load produced a pull of some 15,000 pounds available for hauling trains. By 1876 the Consolidation locomotive with its four pairs of drivers had become generally accepted as the heavy freight motive power, and axle loads had increased to 25,000 pounds, making possible a maximum pull of 25,000 pounds. In 1884 the first 80-pound rail was laid; the 95-pound rail was introduced in 1891 and the 100-pound came in 1892. By 1900 axle loads had increased to 40,000 pounds, and draw-bar pull to 40,000 pounds. Just after the turn of the century, locomotives with five driving axles were adopted as standard on the Santa Fe, and they became generally used within the succeeding 15 years in heavy freight service on other roads. For heavy grades the Mallet type, introduced from Europe, with two sets of cylinders and drivers, followed closely on the heels of the Santa Fe type. By the twenties, rail maximum weights had reached 131 pounds and axle loads 70,000 pounds. The larger ten-driving-wheel engines were producing 90,000 pounds pull. By 1930 Mallets had reached a maximum pull of 130,000 pounds. Thus 60 years witnessed an almost tenfold increase in freight locomotive pulling power, and an increase in maximum allowable axle loads of $3\frac{1}{2}$ times. Complementing this was the development of the automatic air brake and the friction draft gear, together with a strong and automatic coupler; all three were necessary to handle the fifty and then the hundred or more cars in a train, which it now came within the power of the locomotive to haul. The ineffectiveness and expense of stopping a long freight train with hand brakes made necessary a device that would automatically and powerfully apply the brakes from the locomotive. The impossibility of starting a long train as a unit made necessary a device that would allow slack between the cars so that they could be

industry: the "Consolidation"-type locomotive. He also had the misfortune, often encountered by men of his type, to develop equipment far ahead of practical use. His ten-driver, "Decapod," fell in the latter class.

started serially, but at the same time would absorb the excessive shocks otherwise arising from the slack running in and out. George Westinghouse, more than anyone else, was responsible for developing the automatic air brake to meet the first need and the draft gear for the second.

Parallel with the foregoing development came the increased size of freight cars. The standard coal car of 1870 was a drop-bottom car weighing 16,000 pounds, about 22 feet long, with two four-wheel trucks, and with a capacity of 10 to 12 tons. The load per axle on this car was 10,000 pounds. As a result of improved rails and better car materials and construction, the capacity of cars was increased 50 per cent within the next 10 or 15 years. By 1895, 35-ton capacity hopper cars had been adopted, and 10 years later 50-ton capacity cars had been introduced. Thereafter followed the 70-ton car and, for special operations, a 100-ton capacity car, both having two four-wheel trucks; they had axle loads, respectively, of 45,000 and 65,000 pounds. This particular development is significant not only because of the sevenfold increase in carrying capacity of the standard coal cars, but also because the heavier cars and loads do not require an increase in pull (on level track) corresponding to the increase in load.² Thus the heavier car enabled a locomotive of a given pull to carry decidedly more freight on the level stretches of the railroads.

Physical growth of the railroad system

In the East. The rate of development of the country's railroad system after the War Between the States varied widely as between periods and regions. The reasons for construction also showed considerable divergence. East of the Mississippi and north of the Ohio most of the new mileage after the war grew from the competitive desire on the part of existing railroads to secure greater bargaining power in respect to traffic. For example, in the 1870's the Pennsylvania built its own line from Baltimore to Washington to avoid using the Baltimore & Ohio, and the Boston & Maine built from Portsmouth, New Hampshire, to Portland, Maine, rather than use a competitor's line. In the same decade the Baltimore & Ohio projected its system west from Ohio to Chicago, in order to be on more nearly equal terms with the Pennsylvania and the Vanderbilt systems in competing for western traffic. The Baltimore & Ohio had earlier obtained access to St. Louis, but it did not want to miss the growing Chicago traffic. In the 1880's the Erie followed suit and built its line to Chicago. In a less extensive way, the Delaware,

² Because the elements of friction in ordinary bearings do not increase with an increased weight on the bearing, there is surprisingly little more pull required to move a heavily loaded car than to move an empty car on level track. A coal car loaded with 50 tons of coal takes 210 pounds of pull to move it at 10 m.p.h. compared to 140 pounds when it is empty.

Lackawanna & Western and the Lehigh Valley attempted to provide traffic for themselves by reaching west from the anthracite regions of eastern Pennsylvania to the Buffalo gateway. The desire of business interests in Minnesota and Wisconsin to insure the best possible rates to the East led to the projection in the 1880's of two lines across northern Wisconsin to the Soo. With the Canadian Pacific east of the Soo, these lines formed strategically important routes, joining the West with Atlantic ports. The period between the panic of 1873 and the depression of 1884 represented the peak of building, with this sort of motivation typical in the area east of the Mississippi and north of the Ohio. By the 1890's it had tapered off sharply, although sporadic instances of it continued on through the 1920's. In 1925, for instance, the Pennsylvania, in conjunction with the Pere Marquette, built a line from Toledo to Detroit to tap the rapidly developing traffic of the latter city; while in the same year the Norfolk & Western built a line from Cincinnati to Columbus to obtain better facilities of its own for delivering West Virginia coal to the Middle West.

The 1873-1884 period also witnessed the greatest amount of purely promotional railroad construction in the East. The 1,000 odd miles of the West Shore Railroad from New York to Buffalo and the New York, Chicago and St. Louis ("The Nickel Plate") from Buffalo to Chicago were the biggest projects with this background. Finished in 1881, closely parallel to Vanderbilt's New York Central and Lake Shore and Michigan railroads, the promoters of the West Shore and "Nickel Plate" seem to have had in mind a possible sale to the latter for nuisance value.³ The unfinished South Pennsylvania project of the same period, now the route of the Pennsylvania motor turnpike, represented something of the same sort of thing in the Pennsylvania Railroad territory. Numerous abortive attempts of this kind continued through the early 1900's.

The relative position of railroad construction east of the Mississippi and north of the Ohio after the War Between the States was, however, essentially a declining one. Whereas the construction of new lines in the Middle Atlantic states had accounted for 15 per cent of the country's total from the war to 1873, the share fell rapidly, so that between the depressions of 1887 and 1892 it accounted for but 6 per cent. The proportion of building in the north central states from Ohio to Illinois and Wisconsin likewise hit its peak of 26 per cent before 1873 and fell by the turn of the century to but 15 per cent.

In the South. In the South, after the war, where there was still much basic coverage to be provided east of the Appalachians, the tendency was for the construction to be carried out as it had been earlier: by

³ The New York, Chicago and St. Louis was reputed to have acquired the name "Nickel Plate" when Vanderbilt remarked on paying an exorbitantly high price for it, that the price would warrant his expecting to have it all nickel plated.

local lines, which were later combined to form more sizable operating systems. West of the Appalachians, the larger properties appeared earlier. But the amount of construction undertaken in the years from the war to the panic of 1873 was small compared to the other parts of the country; from 1873 to the depression of 1884 it still lagged, but from 1884 to the depression of 1892 some 15 per cent of the country's new mileage was laid in the South, and during the following 10 years the same proportion was maintained.

It is astonishing how the well-developed coastwise water carriers and the barrier of the Appalachians delayed the opening of many of the final links in the long-haul railroad routes of the South. The first post-war rail crossing of the Appalachians south of the Baltimore & Ohio was that of the Chesapeake & Ohio in 1873. The second was a full nine years later, when the line west from Asheville, N. C., was completed. The third did not come until 10 more years had passed, when the Norfolk & Western reached over to the Ohio River Valley in 1892. In 1900 the Clinchfield finished its crossing from North Carolina to Tennessee, and the Virginian in 1907 built the last transmontane route. The delay in the opening of through north-and-south routes east of the mountains was equally great. The present main line of the Southern was completed to Atlanta in 1873. Not until 20 years later was the last gap of the present Atlantic Coast Line main route finished in North Carolina. Not until 1900 was the Seaboard Airline's through route completed.

The last large-scale construction in the South occurred in Florida. While the northern part of the state had had railroad lines as early as the 1850's, the heart of the state was not reached until the 1880's, and it was not until a decade later that the southern parts were reached by the Florida East Coast. Considerable mileage was added just before the First World War, and the 1920's witnessed further increases. Florida in that last period was one of the few areas in the United States where any sizable amount of railroad construction was carried on.

During the 1880's and 1890's competitive building similar to that in the East accounted for an important part of the new construction in the South. The predecessors of the Southern Railway reached from Atlanta to Cincinnati in 1880 and pushed west to Mississippi in 1889, all in Louisville & Nashville territory. The Seaboard Airline's predecessors along the Atlantic Coast developed their western connection to Birmingham in 1892, reaching Montgomery also in 1891. The early 1900's witnessed the struggle for control of traffic in Florida by way of the competitive building of new railroad lines, which was continued to the middle 1920's with the Seaboard Airline's 274-mile extension to Miami, already served by the Florida East Coast.

In the Prairie states. In the Middle West, the roads that had reached

the Mississippi River before the war pushed on through the plains. The nature of construction changed rapidly from that of providing clearly necessary lines of communication to that of wild competitive and promotional building. In the 1880's particularly was the construction in this category.⁴ It was this stage that provided the prairie states with the highest mileage per capita of any part of the country and left its impress of the most closely knit web of lines on the railroad map of the United States. Each system extended its branches into every section of rich farm land within reach and attempted to reach its share of the major commercial centers: Chicago, St. Louis, Omaha, Kansas City, Minneapolis, or Denver; as well as the minor ones, Sioux City, St. Joseph, and the like. The Santa Fe, which originally had its eastern terminus at Kansas City, projected a line to Chicago to protect its bargaining strength in the Eastern markets with the Eastern railroads. One of the predecessors of the Chicago, Milwaukee & St. Paul pushed in the reverse direction westward to Kansas City. The Chicago, Burlington & Quincy built west to Denver to insure its bargaining strength against inroads of the Missouri Pacific, which built to Pueblo. The Burlington in these years also forged northward from Illinois to St. Paul, in order to enter the northwestern region. The Chicago, Rock Island & Pacific also built across the prairies to Denver to keep up with the rest. Denver, which had been dependent for its eastern communications upon a branch of the Union Pacific and the Kansas & Pacific line from Kansas City, found itself the terminus of two other main-line railroads. In the same period both the Burlington and the Chicago & Northwestern reached into southeastern Wyoming with long branches.

By 1873 Texas had been connected with both St. Louis and Kansas City by a single railroad line. The push of competing roads from the north into this territory, to tap possible riches and gain outlets on the Gulf, was very active in the 1880's. The Fort Worth & Denver City was built from Colorado. The Santa Fe constructed a line across the middle of Oklahoma to Fort Worth, and another to the center of the Texas Panhandle. The Frisco reached from western Missouri to Dallas. Later the Rock Island and the Kansas City Southern entered the Texas area. Activity in new construction continued till the First World War, and in the 1920's the "Panhandle" section of northern Texas became the scene of further extensions following the finding of important oil fields.

⁴The contemporary view of this kind of building is provided by J. L. Ringwalt in his *Development of Transportation Systems* (1888): "Illustrations of the tendency to expand systems, interwoven with the disposition to invade contiguous or pre-occupied territory, which is one of the notable features of modern railway development, were furnished by a considerable proportion of the new construction in the Middle States." (P. 352.)

Construction in the Great Plains states, between the Mississippi and the Rockies, and between the Gulf of Mexico and Canada, accounted for 36 per cent of the country's total from 1864 to 1873. In the next period to 1884 its proportion was 44 per cent, and it retained almost as high a share through to 1900. During the early 1900's the Southwest in particular was one of the remaining areas of the country where extensive construction continued.

In the Western states. The first railroad to cross the Rocky Mountains and the Sierra Nevadas was finished by the juncture of the Union Pacific and the Central Pacific in 1869. Close on the heels of this initial construction came the period, from the panic of 1873 to the depression of 1884, in which the greatest number of routes across the Rockies, Coast Range, and Sierra Nevadas were opened. (See map following.) First an outlet from southern California to the East *via* the Central and Union Pacific was opened by the completion in 1876 of the Southern Pacific line from San Francisco to Bakersfield and over the mountains to Mojave and Los Angeles. Then came a direct route from Los Angeles to the East with a peculiar combination of two competing lines: the Santa Fe, having crossed the Rockies in 1880 to Albuquerque, reached south almost to Mexico in 1881 to join the Southern Pacific route built west from the Los Angeles area. The following year the Texas & Pacific made connection with the same Southern Pacific line at El Paso, and in 1883 the Southern Pacific's own lines east of El Paso were placed in operation. In that year the Santa Fe itself had reached west from just south of Albuquerque to the California line at Needles, to join with a Southern Pacific branch from Mojave. In 1885 this branch was turned over to the Santa Fe, and with a new line over Canjon Pass the latter railroad reached Los Angeles and then San Diego.

In the Northwest equally energetic railroad construction was under way. The Oregon Railway & Navigation Company finished a line along the southern bank of the Columbia River in 1882. The Northern Pacific was pushed across the Rockies in 1883, so that Portland, Oregon, had its eastern connection almost as soon as did Los Angeles. In 1883 the Northern Pacific also finished its connection from Portland to Tacoma, to give Puget Sound its first through eastern service. In 1884 the Oregon Shortline, extending north from the Union Pacific to the Oregon Railway & Navigation Company, was completed, and Portland had a second outlet eastward. In those lush years of railroad building the pattern for the mountain Pacific area was pretty well established.

In the next period, from 1884 to the depression of the 1890's, the Great Northern was the only over-all, east-west addition. The Northern Pacific in 1888 added a line across the Cascades directly to Puget Sound without passing through Portland. In a north-and-south direc-

tion, however, the line joining Oregon with California was finished, and the Santa Fe reached north to San Francisco.

In the first decade of the twentieth century there was a flare-up of

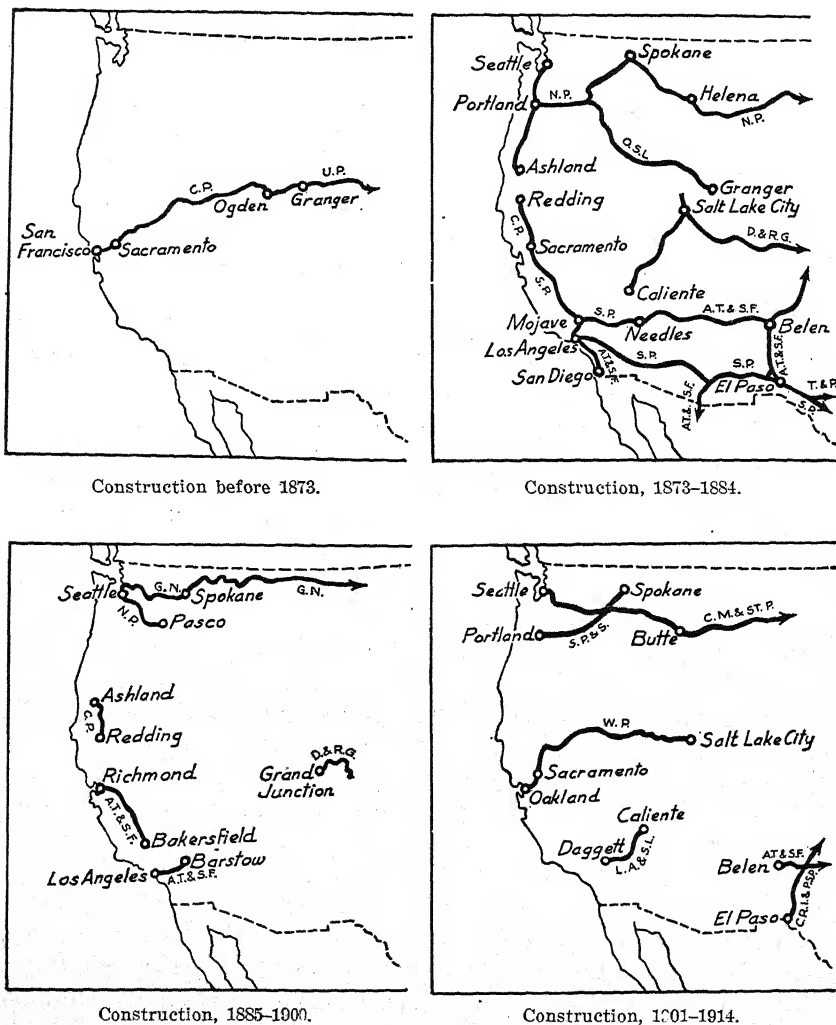


FIG. 2. Growth of the Transcontinental Railroad System. Lines are shown schematically, identified by principal controlling carriers.

transcontinental construction, largely to protect traffic for parts of already existing routes. (See adjoining map.) A Middle Western railroad, the Chicago, Milwaukee & St. Paul, projected its system west from the Missouri River to Puget Sound in 1909, in order to insure that it

could get a reasonable amount of transcontinental traffic.⁵ The city of Los Angeles and the Union Pacific Railroad both improved their bargaining positions by the completion of a line from Salt Lake City to Los Angeles in 1905. Those persons interested in the Denver & Rio Grande promoted the construction of the Western Pacific from Salt Lake City, the western terminus of their line, to San Francisco Bay, with operation starting in 1909.

In the late 1920's and the 1930's an inner north-and-south route from the Columbia River to California was opened through the efforts of the Great Northern, together with the Western Pacific, in competition with the Southern Pacific's older line; as a result, the Southern Pacific built several sections of alternate routes for its line. Finally in 1934 Denver interests completed the last crossing of the Rocky Mountains with the finishing of the Moffat tunnel and the Dotsero cutoff, thus finally placing Denver directly on a transcontinental route, a position that it had long thought necessary to its commercial security.

The country as a whole. In 1870 the country had started the railroad era with 53,000 miles of line, a large share of which was east of the Mississippi. By 1882 the mileage had doubled, and by 1904 it had doubled again. By 1914, after the addition of 39,000 more miles, the country's network reached its approximate peak with 252,000 miles of railroad, nearly one-half being west of the Mississippi. The investment in roadway and equipment stood at some \$15,000,000,000. The end of extensive development of the railroad system was not, however, to mean the marked reduction of investment in facilities. Reductions in grades and curvature, strengthening of track, and betterment of equipment had even before 1914 become a major factor in capital expenditures, so that despite reduction in building new lines, a level of about \$500,000,000 a year was maintained throughout the early 1900's, except for depression years. After the First World War, further intensive development of the already existing lines proved capable of maintaining investment expenditures at dollar values sufficiently above the pre-war level to mean that, in real terms, substantially the same rate of investment continued as had been normal during the extensive growth phase of the railroads.

⁵ A graphic picture of how such construction was motivated is given in the Interstate Commerce Commission's report on the affairs of the Milwaukee: "Everything indicates that the project was the result of rivalry between powerful groups. Miller, Rockefeller, and others controlling the St. Paul felt that they could not tolerate its being bottled up in South Dakota with the Hill lines to the north controlling the Burlington, and the Harriman lines to the south working closely with the North Western. It is obvious that the stockholders in general had no voice in the momentous decision, and as it was not necessary to secure a certificate that the public convenience and necessity required the construction of such a line under provisions of law such as are now a part of section 1 of the interstate commerce act, personal rivalries and ambitions were free to do as they willed with a great property." (131 I.C.C. 615, 618, 1927.)

Railroad finance and consolidation

The history of railroad finance encompasses the promotion and raising of capital for new construction and the security transactions involved in consolidation and manipulation, as well as the whole matter of reorganization of those companies that found themselves in financial difficulties. Most of the techniques of corporate finance, such as the separation of stock between common and preferred, procedures for reorganization after receivership, and the use of the construction company as an intermediary between the operating company and its promoters, had been developed before the War Between the States. It remained to carry them to a far greater degree, to magnify their use and abuse, and to add further refinements in the subsequent years.

Railroad promotion. The post-1865 railroad era was characterized by wide and extreme abuse of the construction company.⁶ One of the most notorious of these, the *Crédit Mobilier*, was used by the Union Pacific in constructing the eastern part of the first "transcontinental" railroad in the later 1860's. The Central Pacific's promoters had a similar company for the western section. In contrast to the earlier period, there was now an important new factor in railway promotion, namely, Government subsidy in the form of land grants and the loan of Federal credit by turning over Government bonds to the companies. The land grants of alternate sections, amounting to half the land in a strip 20 miles wide running with the line, were an attractive bonus either to the railroad companies, which could use the land as lien for mortgages, or to the promoters, who, by means of a construction company or some other intermediary, could siphon off the better land unto themselves for speculative purposes. The Government bonds, not so generally available as land grants, provided a surer source of money than any other security the promoters had to offer. In the case of the Pacific railroads in particular, the principal money for construction was supplied by such Government bonds and by first mortgage bonds having a lien on the donated land. The promoters furnished relatively small amounts of working capital, for which they were quickly reimbursed. They garnered very substantial cash profits and also, for nominal contributions, acquired the common stock that would give them claim on future profits. In the case of the Union Pacific, the promotional arrangements were so outrageous that the road became the center of a great public scandal; indeed, one of the intermediate companies, the *Crédit Mobilier*, became a byword of financial evil. What the Pacific railroads represented on a large scale was duplicated in one phase or another by numerous, less spectacular, small developments for many years thereafter.⁷

⁶ See above, p. 185.

⁷ *Poor's Manual's* comments in 1900 were to the effect, "There was never a period in our history in which, in the construction . . . of railroads, the good sense of our

The cyclical variations in economic activity during those years must, to an important extent, be attributed to such railroad activities. The tremendous surges of financing of new projects, followed by sharp contractions when it became obvious that progress had been too rapid, characterized financing from the 1860's to the 1890's. In the early 1870's a peak of \$500,000,000 a year of new railroad securities was issued, and in 1871 alone over 7,000 miles of new line were built. The recession of 1873 was precipitated by the insolvency of Jay Cooke, the banking firm particularly interested in the Northern Pacific project. In the year 1875 only 1,700 new miles were added. But recovery from the depression brought another period of feverish activity, with \$800,000,000 of new securities issued in 1882. In that year construction reached 11,500 miles. The financial difficulties of the West Shore, in early 1884, and the Ward banking house failure in May, marked the beginning of another slump. In 1885 building dropped to but a fourth of what it had been in 1882. After a short depression another boom of financing followed in 1887 and 1888. The all-time record of 12,900 miles of new construction was reached in 1887. This was to lead to still another depression, that of the 1890's, which proved to be the last one closely connected with railroad enterprise.

The financing of this era was characterized by substantial amounts of stock "watering," that is, the issuance of stock with no more than a nominal cash contribution by the holder thereof, but with the full par value shown on the books as a liability and an equivalent amount added to the investment account on the assets side. *Poor's* estimate in 1900 was that \$1,250,000,000 of the \$3,100,000,000 par value of common stock outstanding in the hands of the public was "watered."

Reorganization. The emphasis on promotional profits led both to construction of railroads far ahead of any markets for their services and to the undertaking of financial obligations that could not be fulfilled. The results were regular waves of financial reorganization for numerous companies in each depression period. The depression of the seventies saw the receivership of the Erie, Northern Pacific, Kansas Pacific, and many other less well-known companies. In the eighties the Iowa Central (now part of the Minneapolis & St. Louis), the Chesapeake & Ohio, the Denver & Rio Grande, the East Tennessee, Virginia & Georgia (now part of the Southern), the Houston & Texas Central (now part of the Southern Pacific), the International Great Northern, the Lake Erie & Western (now part of the "Nickel Plate"), the Minneapolis & St. Louis, the Missouri, Kansas & Texas, the "Nickel Plate," the West Shore, the Ohio Central, the Philadelphia & Reading, the Rock Island, the St. Louis, Southwestern, the Texas & Pacific, the Wabash, and many other smaller

lines were reorganized. The slump of the nineties saw 30 per cent of all railroad securities then outstanding subject to such proceedings. More prominent in the array this time were the Baltimore & Ohio, the Norfolk & Western, the "Santa Fe," the "Frisco," the Union Pacific, the Northern Pacific, the Central of Georgia, and most of the predecessors of the Southern. From 1884 to 1900, some 60,000 miles of line were involved. The last wave of this type was from the panic of 1907 to the depression of 1914-1915, when the Pere Marquette, the Chicago & Eastern Illinois, the Rock Island, the Missouri Pacific, the Missouri, Kansas & Texas, and the "Frisco" were involved. The financial record of these years was not one to inspire confidence in the judgment of many of the railroad leaders or their banker associates.

Empire building. While there had been a preview of the building of railroad empires in such instances as the formation of the New York Central out of numerous small connecting lines in 1858, the great surge in this direction did not get under way until after the War Between the States. Empire building was to be a major factor in the railroad industry from then until the First World War. It was responsible for much of the competitive building and many of the financial difficulties already discussed. It was also behind the trend toward loss of the separate existence of many railroads through purchase, lease, or other means of obtaining control. The basic motive behind this consolidation movement was the "scotching" of competition and the control of traffic so that as much revenue as possible could be brought to a system. The more subtle urge of a sheer will-to-power also played an important part. In particular instances, the possibility of great profits from financial manipulation carried on in the process of consolidation was an additional incentive.

Jay Gould's kaleidoscopic passage over the railroad map of the country represented the high point of the latter motivation. Gould's first major operations in the railroad field involved the Erie in the late 1860's. He had joined the board of directors of the Erie in 1867, made a small fortune selling the company's stock short in 1868, obtained control of the connecting Albany & Susquehanna in 1869, and was finally forced out of the Erie in 1872.⁸

⁸ The operations of Gould and his colleagues and opponents revealed, in the words of Charles Francis Adams, "the deep decay which has eaten into our social edifice. . . . The stock exchange revealed itself as a haunt of gamblers and a den of thieves; the offices of our great corporations appeared as the secret chambers in which trustees plotted the spoliation of their wards; the law became a ready engine for the furtherance of wrong, and the ermine of the judge did not conceal the eagerness of the partisan; the halls of legislation were transformed into a mart in which the price of votes was higgled over, and laws made to order were bought and sold; while under all, and through all, the voice of public opinion was silent or was disregarded." Quoted in F. C. Hicks, *High Finance in the Sixties*, p. 114. New Haven: Yale University Press, 1929.

Gould next appeared in 1873 with temporary control of the Union Pacific, in the course of which he made some speculative profits. A few years later he purchased the Denver Pacific and the Kansas Pacific, which were potential competitors of the Union Pacific, with a view to selling them for nuisance value to the latter road. To establish that value, he was finally forced to buy the Missouri Pacific, the Missouri, Kansas & Texas, the Denver & Rio Grande, the Texas & Pacific, and several other less well-known lines, so that the former two would have connections with which to interchange traffic and so control its routing. This situation forced the Union Pacific to buy the two competing roads as Gould had originally planned, and left him with both a handsome profit at the expense of a competitor and a very substantial railway system in the Southwest made up of the latter lines. With the purchase of the Wabash as an eastern connection for this system, extending to Buffalo, Gould entered the field of competitive construction. He fought the Burlington with the extension of the Wabash to Council Bluffs, with the Missouri Pacific as he built northward into Nebraska, and again with the Wabash when he pushed into Chicago. He allied himself with the Huntington-Southern Pacific group to stave off the threats of the Santa Fe's extension to the Pacific Coast by jointly buying control of the "Frisco." The financial burden of all this, together with the devious devices he employed to unload his holdings on others with a profit to himself, while he still held control, led to financial difficulties after 1884 that were to leave serious scars on almost every company that came under his wing. In the depression of the late 1880's his empire shrank and his power was drastically curtailed, but with little loss to his own personal profit.

On the other hand, systems like that of the Burlington were built up during the same years with most conservative financing and no scandal, even though they were forced into competitive building that their better judgment might have rejected had it not been for the presence of more speculative elements in the field. In between the two, in varying degrees of responsibility, lay the other of the early empire builders—the Huntington-Southern Pacific group, Commodore Vanderbilt, and Joy in the Middle West.

In the period just after 1900, the country witnessed many dramatic episodes in large-scale railroad empire building. In contrast to the earlier emphasis on construction of new lines, this period stressed the acquisition of control of already existing systems. There seemed no limit to size or to the lust for power.⁹ Harriman welded together the

⁹ That there was no limit to the desire to grasp properties was indicated in the Interstate Commerce Commission record in the investigation of the Harriman acquisition of the Union Pacific, Southern Pacific, and other carriers in the early

Union Pacific and the Southern Pacific and dominated the Illinois Central, thus providing a railroad dominion covering a rectangle with its corners in San Diego, Portland, Oregon, Chicago, and New Orleans. In New England, J. P. Morgan and C. S. Mellen, through the New Haven Railroad, controlled substantially every transportation agency. The younger Gould was building a system extending from Baltimore to San Francisco. The questionable financial transactions, the increase in rates, and the abuse of political and economic power that were associated with much of this manipulation, led to the congressional and judicial action that broke much of it apart from 1912 to 1920. A final attempt at empire building came in the 1920's with the Van Sweringens, only to fail because of financial weaknesses.

Government control during the First World War. An interlude to the normal financial history of the railroads occurred during the First World War. As a result of serious congestion on the railroads in the fall of 1917, it was deemed necessary for the Federal Government to take possession of the country's railroads, compensating the companies for their use by a guarantee of a net operating income at the level of the average for the preceding three fiscal years. Owing to a rapid increase in average hourly wage rates and material prices, both during and after the war, the earned income of the railroads well-nigh disappeared by the end of the period of Government control. From the entrance of the United States into the War in April, 1917, to the cessation of Federal control in March, 1920, the hourly wage rates increased roughly 100 per cent and costs of materials similarly. Rates and fares did not increase proportionally, nor did technological factors change sufficiently to compensate for the increase, so the proportion between operating expenses and revenue jumped from between 70 per cent in 1917 to nearly 100 per cent in the first months of 1920, thus leaving in the end a negligible income. In all, for the two years and three months of Federal control, nearly \$900,000,000 was contributed by the U. S. Treasury to the companies in lieu of earned income. The continuance of the guarantee for six months after the cessation of the control necessitated further Treasury aid of over \$500,000,000 to company income, the higher rate of this contribution being accounted for by further inflation that caused expenses still further to exceed revenue.

1900's. Questioned by the Commission as to where his policy of acquisition was to stop, Mr. Harriman said:

A. I would go on with it. ***

A. ** If you (the Commission) will let us, I will go and take the Santa Fe tomorrow.

A. I would go on as long as I live.

Q. Then after you had gotten through with the Santa Fe and had taken it, you would also take the Northern Pacific and Great Northern, if you could get them?

A. If you would let me.

12/ICC/277, 280 (1907).

Government regulation and finance. The abuses in private railroad finance for over half a century were the subject of much private criticism and of several Government investigations. The only possible correctives seemed to be at the hands of the Government, but help from the legislative halls was slow to come. Not until 1913, under the aegis of Senator La Follette, was an act passed requiring valuation of the railroads so that the extent of stock watering could be determined. Twenty more years and the expenditure of about \$200,000,000 were necessary to complete the undertaking. From the survey, it appeared that in most cases the railroads with watered stocks had been able to plow back enough profits into their property to squeeze out most of the "water."

The findings of the Federal Railroad Securities Commission, together with Interstate Commerce Commission reports on financial abuses just before the entry of the United States into the First World War, led Congress in 1920 to give control over railroad security issues to the Interstate Commerce Commission, formed 33 years earlier to regulate rates. At the same time an attempt was made to give financial assistance to weak roads by recapturing excess profits from the more profitable roads and making these funds available to the former. To prevent competitive building, permission of the Commission was required before new construction could be undertaken. The Commission was also required to make a formal plan to guide future consolidation so as to strengthen weaker lines. The results of these regulatory provisions of 1920 were not so far-reaching as might have been expected. The failure to stop in the twenties the financial manipulation that was carried on by the directors of the Rock Island and the "Frisco" in speculative purchase of one another's stock on margin, and that of the Van Sweringens in building up their holding companies, led to the extension in 1933 of the control beyond the railroad companies themselves into the holding-company field and other pertinent areas. The recapture provisions proved unworkable, with few roads showing excess profits, and that phase of regulation was dropped. The planning of consolidation did not lead to the creation of systems more equally balanced as to control of traffic and financial strength, so the Commission was later relieved of the duty of making further plans and ordered merely to check individual consolidation proposals as to their consistency with the public interest.

With the wave of reorganizations in the 1930's, in volume quite reminiscent of that in the 1890's, although arising from causes less directly connected with railroad financing methods, the Government took a hand in establishing a new reorganization procedure. This was done in the hope that finally the burdensome financial structures that so often had been a source of trouble could be liquidated, and that in the course of liquidation the conflicting interests could be resolved without some of the seemingly unfair adjustments connected with the former receiver-

ships. Beginning in early 1932 the Government also extended temporary support through the Reconstruction Finance Corporation to tide over financial embarrassment of supposedly sounder companies. Some \$450,000,000 was lent in this attempt, much of it going to companies which finally succumbed.

Railroad charges

The difficulty in uncovering the history of railroad charges before 1907 lies in the lack of information as to the net rates actually paid for the movement of specific commodities. This is principally owing to the fact that there is no knowledge of the extent of rebates that were or might have been granted. One of the characteristics of the early system of payment for transportation service was that discounts below published rates were widely available to shippers with bargaining power. Large, favorably situated shippers could threaten a railroad with withdrawal of business to a competitor unless special discounts were given. Political pressure could be brought to bear where grants of special charters or other privileges were concerned, or any number of other pressure tactics were usable. The historian is thus left with the general figures for revenue per ton-mile, which provide only a limited basis for a general review of rates.

General rate levels. (a) *History of rate-level changes.* Revenue per ton-mile figures varied widely between various railroads because of the differences both in commodities hauled and in the degree of competition. In New England, 4 cents a ton-mile was quite usual in 1860, yet the Boston & Albany predecessors had a unit revenue of only 2.3 cents at that time. The trunk lines going to the West kept closely to a 2-cent level. In the South, the tendency was for the revenue to be in the higher brackets. During the period of the War Between the States, there was a general rise throughout the country of from 25 to 50 per cent. Thereafter there was a continuous drop until the early 1900's. The first and most spectacular part of this decline, from 1865 to the middle 1870's, can be attributed to a combination of three basic developments: the increased pressure of competition that drastically reduced the margin of profit, the post-war deflation that reduced the price of materials and labor and in turn lowered expenses, and the technological advances and changes in the nature of traffic that decreased the effort needed to produce a ton-mile of freight service. The second and more gradual drop in rates followed on down to 1900. The important forces appeared to be the continued pressure of competition and the lessened effort needed to produce freight service, both working against slightly rising material and labor prices.

The following graph of data for the Lake Shore & Michigan Southern during this period is indicative of some of the factors involved, for a

typical railroad. In this case, from 1870 to 1900 the average freight charge per ton-mile dropped approximately 65 per cent, expenses 55 per cent, and, a general index of improving physical efficiency, train-miles per 1,000 ton-miles, 69 per cent. Profit per ton-mile dropped 50 per cent in the first five years after 1870, held fairly constant to 1890, and dropped further during the 1890's. Almost the entire drop in rates and expenses after 1875 could be justified by the technological advances of the type mentioned earlier and the changes in traffic characteristics that allowed a train to haul a greater tonnage of freight.

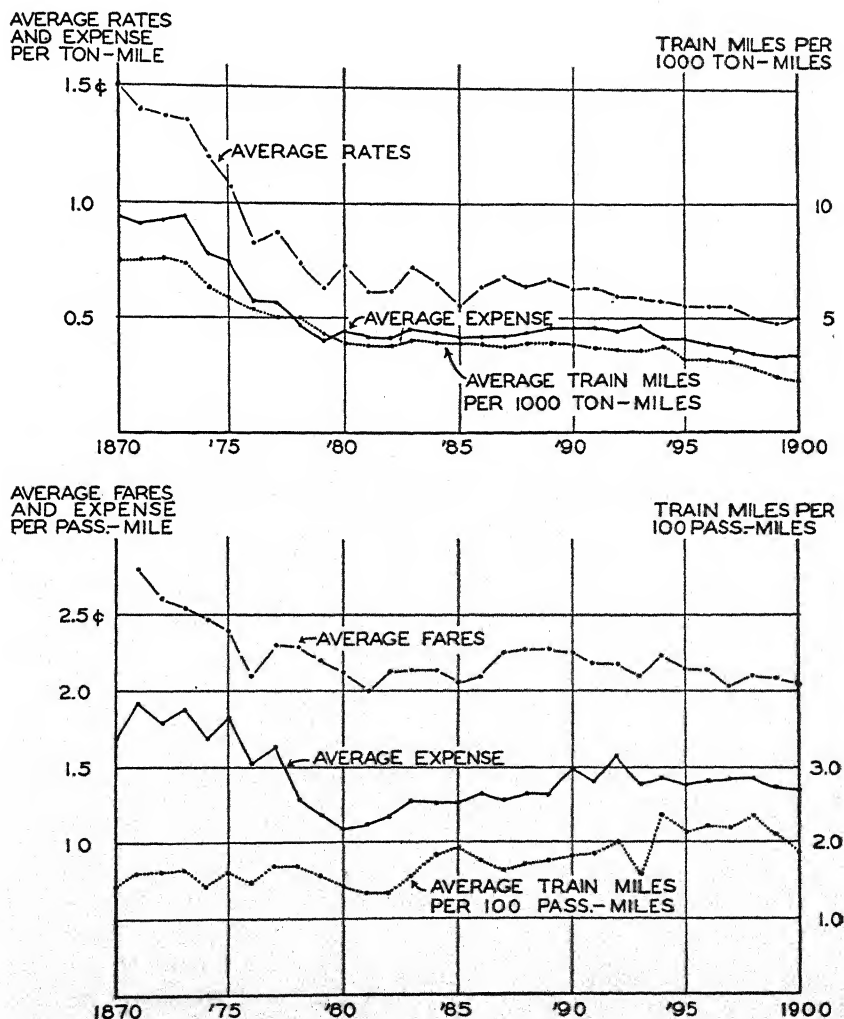


FIG. 3. Trend of Prices, Expenses, and Trainload on a Typical Railroad. Source: L. S. & M. S. Annual Reports.

The parallel history of passenger fares and expenses has quite a different trend. After the deflation just after the War Between the States, fares held closely to the 2-cent level, expenses varied but little, and profit margins were maintained until the 1890's. There was no technological advance in the direction of increasing passenger-trainloads or carloads, as there was in freight service. For the Lake Shore & Michigan Southern, the decline in fares for the whole period 1870 to 1900 was scarcely more than 20 per cent and in expense, slightly more. The average number of passengers per train was less in 1900 by 25 per cent than it was in the early 1870's, contrary to the trend in freight service. The margin of profit was generally the same until the 1890's, when some decline took place.

The late 1860's and the 1870's were a time of great agitation, particularly in the prairie states, for Government regulation to bring railroad rates down. Proposals were brought forth for Government construction of railroads to act as yardsticks for private operation and so force rates down. Regulatory commissions and even direct legislation were also favored as means for achieving the same end. The subsequent competition, however, in the main accomplished the desired reduction in rates, and that argument no longer appeared important in the quest for Government control. Some statutes regulating fares and a few in respect to rates were passed and remained in effect.

This competition at times appeared to reach proportions dangerous to railroad income, when the so-called rate wars were in progress. The actual effect on average rates and fares does not seem to have been so serious as the drama of those wars would indicate. The relatively slight yearly variations in the case of the Lake Shore & Michigan Southern, which was in a position to be particularly vulnerable, are indicative of the general situation. Nevertheless, the railroads, fundamentally not liking competition, devised their own pools and trade associations, which they called "rate associations," in an effort to stabilize prices. By the 1890's, the pools were declared illegal and were effectively outlawed. The associations, however, had become an integral part of the railroad pricing process, even though the Supreme Court under the Anti-trust Laws sheared from them some of their formal procedures for control. In this modified form they have remained an important indirect restriction on freedom of rate change by individual carriers down to the present.

After 1900 average rates for the country as a whole stayed close to 0.75 cent per ton-mile, and fares remained at about 2.0 cents per passenger-mile until our entrance into the First World War. Thereafter there was an average rise of 79 per cent in freight rates and 50 per cent in passenger fares to peaks in 1921. During the 1920's, rates receded gradually to 1.09 cents per ton-mile in 1929, on down to a low of 0.95 cent in 1937, still 32 per cent above the level of the early 1900's. Fares

dropped more slowly to 2.81 cents per passenger-mile in 1929, and rapidly during the 1930's to 1.80 cents in 1937, roughly 10 per cent below the general level before the First World War. Although the railroad objective had been to raise freight rates during the depression of the 1930's, to make up for increased costs, competitive pressures in respect to many commodities caused an over-all decrease. With passenger fares, the fact of widespread highway competition finally became effective in forcing general reductions.

(b) *Government regulation of rate levels.* As the rates decreased in the eighties and nineties, the railroad companies showed more active interest in the general rate level. The railroads were particularly concerned about any downward pressure that the newly formed regulatory commissions might exert on rates. The basic legal premise involved was that rates should be fixed so as to avoid taking property without due process. In a long-echoing decision, the Supreme Court in 1898 established the doctrine "that the basis of all calculations as to the reasonableness of rates . . . must be the fair value of the property . . ." ¹⁰ and that any company is "entitled to ask" for a "fair return" on that value. Out of this decision grew a feeling, beyond the probable intent of the Court, that the railroads virtually had a right to earn a fair return on a fair value almost irrespective of the laws of supply and demand. No matter what judgment had been used in locating railroads, or what their expenses were, or what their prices and services were in relation to other prices and services, this fair return should be forthcoming. This feeling was crystallized by a careless popular interpretation of the 1920 Transportation Act's requirement that the Interstate Commission "initiate . . . or adjust . . . rates so that carriers will . . . earn an aggregate annual net railway operating income equal, as nearly as may be, to a fair return. . . ." These words were unfortunately taken to mean that the Commission would guarantee the return.

The permeation of this feeling through the railroad organizations shifted the emphasis in much of railroad pricing policy away from ordinary commercial considerations to the idea that the community owed the railroads the fair return, come what might. From this point it was all too easy to argue that if existing rates did not produce a fair return, it was merely necessary to increase these rates. Thus with the depression of the 1930's, when business fell off and other prices dropped, the railroads asked for increased rates. In the 1940's, when business recovered to higher levels, increased rates were asked for again. It apparently occurred to few railroads that their profits might be increased through expanded business that would be attracted by lower charges.

The failure of either the legal doctrine of fair return or the Commis-

¹⁰ *Smyth vs. Ames*, 169 U. S. 466, 546 (1898).

sion's injunctions under the 1920 Act to produce such a return for the country's railroad system as a whole, or for many individual railroads, together with an increasing realization of the economic impossibility of so doing, led Congress to change, in 1933, its general rule of rate making. Instead of attempting to adjust rates in light of a fair return, the Commission was merely required to give "due consideration . . . to the effect of rates on movement of traffic . . . and to the need of revenues sufficient to enable carriers . . . to provide such [adequate] service."

Government regulation of rate relationship. From the point of view of those directly interested in rates, the most important fact is the relation of what one shipper pays to what another pays. For that reason, the rebates mentioned above, together with other forms of discriminatory charging, quite early attracted public attention more than did the general level of rates. The policy of favoring powerful shippers and discriminating against the weaker ones was carried to extremes in the 1870's and 1880's. The Standard Oil interests went so far as to get a share of the rate paid by independent oil companies for transportation of their oil.¹¹ In spite of railroad protests against Government interference with their private business affairs, the public's interest finally prevailed upon numerous state legislatures to pass laws and form commissions that would be directed toward the eradication of discriminatory pricing. Finally the major responsibility was assumed by the Federal Government, with the passage of the Interstate Commerce Act and formation of the Interstate Commerce Commission in 1887. There proved, however, to be a long legal and congressional battle before the public's objective was reached. The railroads were successful in evading much of the effort of state regulation by arguing that they were involved in interstate commerce, which could not be impeded by the state orders. They further persuaded the courts to so interpret the provisions of the Interstate Commerce Act that they became almost worthless in controlling the discriminatory rate practices. In the early 1900's, rebates and discrimination were as prevalent as they had been before the passage of the I. C. C. Act. It was not until Theodore Roosevelt's presidency and his advocacy of effective legislation in the form of the Hepburn Act of 1906 and the passage of the Mann-Elkins Act of 1910, together with a change in the attitude of the Supreme Court toward recognition of the administrative function of the Interstate Commerce Commission, that Government regulation really began to operate at all effectively. Further legislative provisions in the 1920 Transportation Act and the strengthen-

¹¹ The Senate Report of 1874 keynoted "the evils of unjust discrimination against one locality in favor of another, or in favor of one description of trade at the expense of another . . . and of uncertainty and favoritism by means of special contracts, rebates, drawbacks and the thousand and one other means by which a rich and powerful company may, by the secret adjustment of rates, impose upon the public." *43rd Cong., 1st Session, Sen. Report No. 307, Part I, p. 137.*

ing of the Commission by Supreme Court decisions just before the First World War and in the 1920's finally established a substantial measure of control. The railroads could still make many changes in rates or fares of their own volition after passing through the rate association committees, if such changes were published with due notice and in proper form. Large numbers of such changes are made with no action on the part of the Commission. The control is effective indirectly, however, in that the railroads know that they must not make unfair rate adjustments (which leaves considerable leeway). In a certain number of instances where valid complaints are raised as to unreasonable, discriminatory, or prejudiced changes, the Commission directly orders correction.¹²

General changes in character of railroad traffic

Only since 1900 have there been any statistics available as to the general sources and volume of railroad traffic that might furnish an indication of changes in the flow of the traffic. In 1900 about two-thirds of the country's mine products originated in the East (defined roughly as the area north of the Ohio and Potomac Rivers and east of, but not including, East St. Louis and Chicago). There was a gradual decline in this proportion until the East accounted for but 43 per cent in 1940. Most of the increase came in the South (defined as the area east of the Mississippi and south of the Ohio and Potomac Rivers), which originated 12 per cent of the total in 1900 and 25 per cent in 1940. In respect to products of agriculture, the East has likewise lost, dropping from 33 per cent in 1900 to 21 per cent in 1940, while the West (that is, the area west of Lake Michigan, East St. Louis, and the lower Mississippi) rose from 56 per cent to 67 per cent and the South added slightly to its 9 per cent proportion. In the origination of manufactured and miscellaneous products, the East dropped from about 69 per cent in 1900 to 59 per cent in 1940, some of the increase going to the South, for which the proportion increased from 11 per cent to 14 per cent, but most to the West, which showed a rise of from 20 per cent to 28 per cent. The East has lost heavily in forest products, the decrease being from 39 per cent in 1900 to 7 per cent in 1940, while the South increased from 20 per cent to 34 per cent and the West from 41 per cent to 59 per cent. Taking all commodities into account, the East was the originator of approximately 60 per cent in 1900 and only 43 per cent in 1940. The South about doubled its proportion, rising consistently from 12 per cent to 25 per cent and the West's proportion rose erratically from about 28 per cent to

¹² In the words of the Supreme Court, "so long as the (Interstate Commerce) Act continues in its present form, the great mass of rates will be carrier-made rates, as to which the Commission need take no action except of its own volition or upon complaint." 284 U. S. 370, 390 (1932).

32 per cent. The increased use of a wide range of the South's resources is clearly evident in these figures, as is also an increase in the manufactured, forest, and agricultural products of the West.

Along with the shift in origins of traffic, the proportion of freight service performed by the railroads of each of the various regions also changed. The East's share of the country's ton-miles dropped from 56 per cent in 1890 to 40 per cent in 1940, while the South's increased from 10 per cent to 24 per cent, and the West's varied from 34 per cent to 36 per cent. The average haul of freight for the country as a whole increased gradually from 247 miles in 1900 to 316 miles in 1930. In the following 10 years, with the effects of highway competition for the short hauls being more keenly felt, it increased further to 350 miles.

This change in growth of railroad freight traffic that occurred over the period for which statistics are available is significant with respect to the development of commerce within the country. From 1890 to 1902 traffic doubled, by 1913 it had nearly doubled again, but by 1929 it was only 50 per cent more than it had been in 1913. The rate of increase had dropped precipitantly. The depression of the 1930's made comparison difficult. In 1933 traffic receded to the level of 1911. By 1940 it had reached that of 1924. There was no further growth in sight. The failure of rates to reach their old low levels of the early 1900's and technological advances in other forms of transportation had stimulated competition. The depression gave impetus to the decentralization of industry, methods of decreasing shipping weights, and changes in marketing methods that also took their toll of railroad traffic. The days of peacetime traffic doubling every 10 or 12 years were over.

Water Transportation

Common carriers of general commodities

Water transportation by common carriers of the general run of commodities continued at slightly declining levels for some time after the War Between the States. Operations on the Mississippi River and the Erie Canal remained largely a matter of independent enterprise, but on the Atlantic Coast, on the Great Lakes, and on the smaller rivers in the South the railroads gradually gained a substantial degree of control over their competitors for this general type of business. The Louisville & Nashville Railroad interests quite early dominated water carriers in their territory in the South. By the turn of the century the railroads in the Atlantic Coast section of the South had established an important degree of influence in the business as a bargaining device with Northern roads. The Southern Pacific exercised extensive power over inter-coastal ship routes, whether operating *via* Texas ports, by the Isthmus of Panama, or around South America. The peak of this type of control was reached in the earlier 1900's along with the peak in the building of large-scale

railroad combinations. The New York Central, the Lehigh Valley, the Lackawanna, and others all had their boat lines on the Great Lakes. The New Haven owned practically every coastwise line in New England. The Illinois Central, through its subsidiary, the Central of Georgia, had extended its operations into New York by acquiring the Savannah-New York line. The increase in water carrier rates, along with restrictions on competition that generally resulted from all this, led Congress to limit railroad control over common carrier boat lines by the Panama Canal Act of 1912. Joint water-rail rates were subjected to the power of the Interstate Commerce Commission, and continuance of railroad control of lines that were potentially competitive to the controlling railroads required Commission approval.

The final fate of the water common carrier undertaking to carry the general run of commodities was not to rest in the hands of the railroads or the Commission. Rather, technological progress in highway transportation during the 1920's and the raising of standards of pay and working conditions for labor during the 1930's were forces that brought on the end of many of the coastwise lines. Some of the longer lines, or occasionally a favorably located one, survived. Largely because of the railroads' desire to prevent competitive rate-making by water carriers, but also with the blessing of some of the boat lines themselves, which were anxious to reduce competition, the water common carriers were subjected in 1938 to Interstate Commerce Commission regulation as to rates and entrance into business.

Carriers of specialized cargoes

The other part of the water carrier picture, involving specialized vessels for hauling particular bulk products that can be unloaded easily, has had a different history. Their growth started with the shift in origin of certain of our primary resources from areas relatively near the point of use to more remote ones. The use of Minnesota and Wisconsin iron ore in place of Eastern ore, the use of West Virginia in addition to Pennsylvania coal, oil production in Texas as well as in Pennsylvania and Ohio, all led to the development of heavy water-borne flows of traffic. The first locks between Lake Superior and Lake Huron were opened in 1855 to make the initial developments possible. The Great Lakes movement of iron ore, and of coal in the reverse direction, did not begin in volume, however, until the 1880's. From 1880 to 1895 it increased tenfold, and by 1910 it was five times as much again. During the 1920's the volume of ore doubled over that of 1910, while coal increased slightly. Parallel with this growth there was also a tremendous increase in the movement of grain and flour. By the 1920's a fleet of some 600 to 700 bulk freighters were being used for moving these commodities on the Great Lakes.

Coal and petroleum have constituted the principal types of traffic in-

volved in the specialized coastwise ship operation, although the movement of perishable goods from Texas and Florida in refrigerator ships has been important in recent years. The long-haul coal traffic has developed mainly since 1900 following the opening of the West Virginia coal fields and the development of Norfolk and adjacent ports as transshipment points for the fleet of some 40 colliers operating to New York and New England. The petroleum movement is also of relatively recent origin, developing as it did in conjunction with the opening of oil fields in the Southwest that were connected with the Gulf ports by pipe line. It is the cheapness of specialized bulk water transportation compared to what would have to be paid for the rail hauls that has led to its adoption. The fact that large-scale producing and marketing organizations are the agencies responsible for such transportation has led to direct ownership of a large proportion of the vessels by those organizations instead of their operation as common carriers.

Because energy-supplying materials are such a high proportion of the total tonnage imported into a final-stage manufacturing area like New England, and because of the development of new and remote sources of those materials, such water carriers are as important tonnage-wise as the railroads for movement into such areas. In recent years these water carriers may have accounted for as much as 25 per cent of the total domestic ton-miles of the United States.

Pipe Lines

Similar to the development of specialized water carriers has been that of pipe lines. The first long pipe line was built in 1878 from Pennsylvania to the Atlantic Coast in defiance of high rail rates. The saving in transportation cost to the oil companies led to rapid building of a pipe-line system in Pennsylvania and Ohio and, by 1891, as far west as Chicago. By the depression of the 1890's, there were about 3,000 miles in the system. By 1914 it had expanded to 10,000 miles, with construction west of the Mississippi starting soon after 1900. The 1920's witnessed a further rapid expansion to a network of some 45,000 miles of trunk pipe line, with some 42,000 miles of smaller gathering lines. The capital for the building of these transportation facilities was largely raised by the oil companies themselves, and as transportation agencies they remained essentially private carriers, although they had been legally declared to be common carriers and, as such, were subjected in 1906 to Government regulation, which, however, turned out in most respects to be merely nominal.

Street Railways

That phase of the history of transportation that covers the street railway is unique in that it covers the birth, promotion, maturity, and, in

a wide area, the death of an undertaking. Just before the War Between the States the street railway had been introduced as an improved form of urban transportation. It did not come without some protest,¹³ but its possibilities were too patent to allow any but superficial resistance. With horses and then with the cable as motive power, it developed slowly but consistently in the cities of the country. With the invention of the electric dynamo and motor and their application to railway traction in the 1880's, a real spur was given to the advance of the street railway. This innovation had provided the background from which all the promotional forces, so prominent in steam railroad development, could launch forth. From 1890 to the First World War, the investment value recorded on the books of the street railway companies (including considerable "water") increased from \$400,000,000 to over \$5,000,000,000. Construction companies, stock watering, manipulation, competitive building, and consolidation were in even greater evidence here than in the case of the railroads. The leading street-railway promoters would easily match the railroad magnates for wealth and fame. Widener, Whitney, and Thomas Fortune Ryan were comparable to Harriman, Gould, and Huntington. Nor was the street railway confined to urban operation, for it spread into interurban lines to a remarkable degree. As such it appeared as a competitor of the railroads, and the attempt of the latter to buy control was to add another, not too successful, phase to empire building in the case of the New Haven and the Southern Pacific.

In the midst of all this, during the First World War, the motor vehicle appeared as a threat, in the form of the "jitney." It was resisted by attempts at franchise restrictions, but in the long run such means could not stop the progress in the direction of flexibility, speed, service, and passenger comfort that the final improvements of the bus could offer. From a peak of some 43,000 miles of street railway lines just after the war, the mileage dropped to 17,000 in 1940, and in cities under 100,000 in population the street car had well-nigh disappeared.

Highway Transportation

Before the First World War

The long period of quiet in the field of highway transportation was broken by the outcrop of a "Good Roads" movement in the 1890's. The combined interest of bicylists' organizations, farmers, and the Post Office Department, with its rural free delivery program, pushed this movement

¹³ A contemporary observed of the horse car as a new means of transportation: "It is hardly too much to say that the modern horse car is among the most indispensable conditions of modern metropolitan growth. It is to a city what steam car and steamship lines are to the state and the country. In these modern days of fashionable effeminacy and flabby feebleness, which never walks when it can possibly ride, the horse car virtually fixes the ultimate limits of suburban growth." (M. McClintock, *Report on San Francisco City-Wide Traffic Survey, 1937*, p. 39.)

into prominence. The avenues of promotion lay in several directions. The existing institutions for road building and maintenance were local government units which had taken little initiative and had been far from efficient. The advocates of good roads sought to change this by obtaining the transfer of at least the main rural roads to state highway departments, which, it was expected, would be progressive and far more competent. Thus the new institution, the state highway commission or department, was started in New Jersey in 1891, had spread to several other Eastern states by 1900, and by the First World War had become a general thing. Increased funds for highway construction were obtained by initiating the sale of the state and country road bond. By 1914 some \$450,000,000 of such bonds had been issued, roughly one-third of which were state obligations. Simultaneously, Federal activity was started, first in the field of education and promotion and, by 1916, expanded to actual appropriation of funds on a small scale. Parallel with this movement were important technological advances. The use of oil and bituminous materials to improve road surfaces was being developed, concrete surfaces were introduced, and road-building machinery was being improved.

From 1890 to 1910 was the period in which the "spade work" was being done in developing the motor vehicle, taken for granted today. While the invention of the internal combustion engine and automobile had taken place in the preceding decade, there were, at the turn of the century, many who believed that the electric automobile was to be the accepted type of car. The early 1900's were to settle the question, as well as to see the final objective reached—a low-priced, reasonably reliable vehicle. In 1909 100,000 new cars were produced and by 1912 Ford had reduced the price of his Model T to \$600. By 1917 the annual rate of production had reached nearly 2,000,000 passenger cars, and truck manufacture had also reached large-scale proportions.

The economic pattern of highway transportation was established in channels quite different from those of any other form of transportation. One part, that of providing the way, was firmly fixed in the hands of the Government. The other part was predominantly in private hands. In the main, there was no operator of equipment who produced and sold a transportation service. The individual automobile or truck owner had his own equipment and produced transportation with them as he saw fit, paying for his own operating expenses as he went along.

After the First World War

In the 1920's highway transportation came into its own. Technological advance continued until a degree of vehicle reliability, comfort, and speed was achieved that was beyond the dreams of the pre-war period. By the end of the decade an investment in vehicles of over \$10,000,000,000

(after deducting depreciation) had been built up. Accompanying this activity was none of the financial indigestion that had attended a comparable increase in railway investment. Even the depression of the thirties brought no serious difficulties.

The improvement of highways was an equally important part of the picture. A billion dollars a year, more or less, was spent through the 1920's and 1930's in an attempt to create a rural highway network that would cover the country adequately and be of such a standard that it would be up to the advanced designs of the vehicles. Hard-surfaced, concrete, or hard bituminous rural roads increased from some 40,000 miles in 1920 to about 110,000 in 1929, reaching nearly 200,000 by 1940. The mileage of the lower-type surfaced roads increased from about 300,000 to over 1,000,000 during those 20 years. In addition, curvature was reduced, congested areas by-passed, and driving characteristics generally improved. By 1940 the total investment in roads and streets had reached an estimated value of \$20,000,000,000.

The financing of this post-war highway investment started along its earlier pattern, with issuance of local and state bonds of \$200,000,000 to \$300,000,000 per year, with growing Federal aid and with substantial use of general tax funds. With the gradual spread of the gasoline tax, started in 1920, and the revision of license fees in the direction of use-taxes, the burden of financing was shifted to the users. The supply of these new funds reached \$1,000,000,000 a year by 1936. They were used for maintenance and operation expenses as well as for investment. Highway-bond finance, except in two states, has not involved the readjustments or manipulation that were seemingly a normal part of railroad finance. With the shift from bonds to current payment by users for investment, the financial structure has become even more stable. Furthermore, the rate of highway construction has fluctuated far less than has that of the railways. Unlike the latter, there has been no building of 12,000 miles in one year and 3,000 in the next.

While highway transportation developed in the face of a huge investment in already-formed transportation facilities of older types, the fact that so much of it was in the hands of individual small users and that its possibilities were so attractive to those users, prevented vested interests from hindering highway progress. In that part of its use which involved for-hire operations, however, namely "jitney," bus, and common carrier trucks, an early conflict developed with the older forms of transportation. In the case of the street railways, the Government regulatory agencies were soon called upon to restrict jitney operations under the guise of protecting public interest. This restriction was made effective in varying degrees by control of franchise rights. Then, in the latter 1920's and even more so in the 1930's, the street railway companies took over the new means of transportation themselves. By 1940 the

street car was the principal carrier in cities of over 500,000 population only, and the bus had all but displaced it in cities of under 100,000. Intercity bus operation developed to a greater extent independently of existing rail operations. It almost completely liquidated the electric interurban lines and became a vigorous competitor of the railroads, primarily because of lower fares. It provided, in general, more effective coverage of the country than was possible with railways, where routes were fixed to those of a limited mileage of railroad lines. A substantial number of railroads gradually bought control of the bus carriers within their territories or built up their own operations. In other cases the railroads were content to have merely a part voice in the control of a major bus company by something less than half ownership, as is the case in respect to the local Greyhound companies.

Truck operations for hire have run into more conflict with existing railroad service and organizations than have the busses. Initially truck competition was treated rather lightly by the railroads; then when the impact became obviously serious, the trend was to create all possible restrictions to such operation. Railroad management and labor joined hands in undertaking to protect the public from such evils as overloading of pavements with large trucks and in imposing Government regulation on private business in the form of trucking companies. The railroad interests were hardly impartial advisors in respect to these matters, yet they were the dominant force in the legislative halls when the laws and rules were drawn up. The result has been that the common carrier trucks (and to a lesser extent contract trucks), and along with them the busses, have been subjected to Government regulation in pretty much the same terms as the railroads and by the same commissions as previously had been entrusted with controlling the railroads. There was astonishingly little recognition of the difference in economic characteristics of the motor carriers and railroads in respect to such fundamental matters as optimum size of firm, the possibility of monopoly, and the ease of entry into business. The power of vested interests in a mature economy was forcibly demonstrated.

The economic history of highway transportation, or for that matter of transportation as a whole, can hardly be complete without an appraisal of the widespread effects that such innovations as the motor vehicle and hard-surfaced roads can have on a mature economy. They came, as no other major transportation had come, upon a country that had finished its pioneering and had fully provided itself with a stock of both general producing equipment and plant and transportation facilities. Existing transportation facilities were made obsolete in many areas. Important aspects of land utilization were subject to modification, with a vast change in values. Residential, commercial, and industrial locations were subjected to new forces, the full effects of which have not

yet been fully felt. The mobility of population has been considerably increased. Had the revolutionary impact of the new development been foreseen, or had the strength of the vested interests of owners and employees of the older facilities been as great as in those countries where the Government has a greater control in transportation matters, the innovations quite likely would not have been allowed as great freedom as they had. The economy would have been deprived of much of the stimulus which that development has given it, and the people would not have had as great an increment added to their stock of resources as actually resulted from the new form of transportation.

Air Transportation

The economic history of our national transportation system includes the invention of the airplane and the birth and childhood of air transportation. From the Wrights' first successful flights in 1903, to the first scheduled air-mail service in 1918, to the start of the commercial common carrier air line system in 1926, was the span of gestation of the air transportation industry. Rapid technological advances characterizing that period have continued to operate ever since. The basic science of aerodynamics has been established. The progress in engine design from the 12 H.P. engine of the 1903 plane to units of over 2,000 H.P. today, and the advance in design, size, speed, and carrying capacity of the planes themselves, represent a rate of technological advance never witnessed before in the transportation field. What the ultimate possibilities are likely to be cannot be deduced from history—the future alone can answer.

The scheduled air line system of the country grew rapidly from its beginnings in 1926. Within three years, some 30,000 domestic route-miles were in operation. During the depression of the 1930's, this mileage was not exceeded, but after 1937, increase continued until by 1940 the system exceeded 40,000 miles. The magnitude of service increased even more rapidly. Passenger miles doubled from 1930 to 1933, from 1933 to 1935, and again by 1939. In 1940, a billion revenue passenger-miles were flown, equal to 14 per cent of the passenger-miles in railroad sleeping and parlor car service. Fares had declined from an average of 10 cents a mile in the 1920's to 5 cents in 1940, this last to be compared to about 3½ cents per mile for combined railroad Pullman charges, with food additional. Air transportation is clearly a potent competitor for high-class railroad passenger service. For mail and express, the air lines' inroads have likewise been important, but percentagewise not so high. In respect to freight, the air-borne proportion has been infinitesimal, with rates, actual or potential, far above those of the railroads.

The economic pattern of air transportation has been a complicated one. Private corporations have developed the plane operations, while the landing fields and airways have been almost entirely in the hands of

Government agencies. This has allowed expansion of operations with astonishingly small amounts of capital through the corporate channels, with not over \$50,000,000 investment as of 1940. Government, on the other hand, has had to provide many hundreds of millions for its facilities, with but little return. While the small amount of capital necessary for operation would seem to have made entry into the business easy, the dependence at the start upon mail revenue made the Postmaster General's limitations on number of carriers an important restraint. Replacement of this control by the standard Government regulatory commission certificate of convenience and necessity has perpetuated the restrictions.

With complete Government regulation inaugurated in 1938, only 12 years after the birth of the air line system, we have a picture never before presented in the history of transportation, namely, regulation of entry into business, of rates, of finance, and of combination in the early stages of growth. The past success of providing the country with ample facilities of each type of transportation agency without much Government control has played so important a part in the progress of the country, notwithstanding the many problems arising in the course thereof, that a serious burden of proof will be placed on Government regulation in its new environment to see that the full possibilities of air transportation are realized.

Air resembles highway transportation, rather than railway, in that individual private transportation is an important element in the field. From the outset there have been far more individually operated planes in peace times than commercially operated ones, and it may well be that the most revolutionary phases are those yet to come in the field of private operation. Also, as with the highways, the Government during the first phases has provided the fixed facilities out of general tax funds or by borrowing, allowing use free, or for nominal charges, to all properly licensed. Whether the future will see taxes and fees increased on aircraft operation toward a pay-as-you-go basis, to the extent that they have been levied on highway vehicle operation, will make a great difference in the economic position of air transportation. With questions of this sort still to be answered and yet with the answers so important, we are obviously on the threshold of a new chapter in transportation history, which may be as revolutionary in its economic consequences as any yet witnessed.

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CHAPTER 24

Foreign Trade and Commercial Policy Since 1860

Institutional Changes in the Organization of Foreign Trade

AMERICAN ORGANIZATION for the conduct of foreign trade continued, after 1850, to show gradual modification along lines already indicated in the preceding period of our development. The status of the old-fashioned overseas merchant as an independent middleman buying and selling goods at his own risk continued to shrink; he was superseded by trading houses that conducted business on a narrower and surer margin of profit by taking commissions for executing orders of either foreign or domestic buyers and sellers. In theory it is possible to distinguish between foreign trade houses that (1) act on a commission basis in filling foreign orders, (2) act as sellers of manufactured goods on the basis of specific arrangements with manufacturers, and (3) act on their own account like the old-style merchant house. In practice, however, all these functions are frequently performed by the same organization, with the emphasis shifting to the first two types of activity. In addition, the foreign trade house will frequently use its facilities to aid foreign business interests in disposing of their goods in the American market.

Alongside the commission houses and the agents, brokers, and banks operating in the highly organized markets for international staples, new institutional arrangements came into play with the growing export opportunities for American manufacture. This has been called the development of direct foreign trade, to distinguish it from the indirect methods of trading through the use of a variety of independent intermediaries. The reasons for this structural change are not far to seek. As long as the export trade of American industry was casual, intermittent, and geographically widely dispersed, it was best served by utilizing the established export firms with their specialized knowledge and equipment to care for the details of engaging shipping space and marine insurance, delivering the goods to the customer and arranging credit terms, and securing conformity with the many Government regulations at home and abroad. But in many cases such a purely passive policy did not appeal to manufacturing concerns, accustomed in the domestic market to aggressive policies of demand creation for their specialties. The export firms were frequently unsuited, if not hostile, to special sales efforts on behalf of branded products and trade names. Hence, when the volume

of sales in particular foreign markets showed prospects of great increase, industrial corporations proceeded to set up their own marketing organization abroad, complete from facilities for the physical storage and handling of the product to the building up of "good will." Particularly in the case of products requiring service after sales in making repairs and adjustments did the advantage of such a course appear very real.

Sewing machines, petroleum products, cash registers, steel products, agricultural and other specialized machinery, shoes, soap, and the products of the meat-packing industry were prominent early examples of American goods that were sold in foreign markets in this way. In 1929 it was estimated that a total of 938 American branch houses were operating abroad in foreign selling, with an aggregate investment of \$362,000,000. These figures exclude the large investment of the petroleum industry in foreign distribution estimated at \$500,000,000. In order to facilitate more systematic control over foreign market possibilities, Congress passed the Webb-Pomerene Export Trade Act in April, 1918. This act permitted producers to combine their resources and activities in the quest for foreign markets, though similar combinations in the domestic market remained subject to the restraints of anti-trust legislation. At one time or another, 120 associations were formed to operate under the terms of this act in the entire period from 1918 to 1939, with a total membership of 2,074 companies. The total exports of these associations rose to a peak in 1929, when they accounted for a total export of \$724,000,000.

The Expansion of American Industry Abroad

The tendency to assume control over international marketing functions has been only one aspect of the broad front on which American industry penetrated beyond our political frontiers. Table 1 illustrates the character of this advance.

TABLE 1
UNITED STATES DIRECT FOREIGN INVESTMENTS, 1897-1935*
(In millions of dollars)

	1897	1914	1919	1929	1935
Sales Organizations	56.5	169.5	243.0	362.0	325.0
Purchasing Organizations	5.0	9.0	11.5	16.1	20.0
Banking	10.0	30.0	125.0	125.0	125.0
Oil Distributors	75.0	200.0	275.0	487.0	509.0
Oil Production	10.5	143.0	328.5	854.0	872.5
Mining:					
Precious Metals	88.0	232.7	219.0	262.3	259.3
Industrial Minerals	46.0	487.0	657.3	964.5	958.8
Agricultural Enterprise	76.5	355.8	587.0	985.8	586.6
Manufacturing	93.5	478.0	795.0	1,821.0	1,870.0
Railways	143.4	255.1	297.3	308.7	260.5
Public Utilities	22.1	133.2	137.9	1,025.2	1,088.0
Miscellaneous	8.0	159.0	203.0	341.7	344.5
Total Direct Investment	634.5	2,652.3	3,879.5	7,553.3	7,219.2

* Based on C. Lewis, *America's Stake in International Investment*. Washington, D. C.: Brookings Institution, 1938, p. 605.

If the bare bones of this table are clothed with their meaning in terms of the expanding universe of American corporate control, the picture that emerges bears only a faded resemblance to the concept of international exchange as trade between more or less separate, economically autonomous areas under the aegis of a variety of venturesome merchant houses. American industrial corporations have reached out and secured for themselves control over essential raw materials, such as petroleum, copper, aluminum, lead, nickel, zinc, iron ore, manganese, vanadium, molybdenum, tungsten, tin, nitrate, cane sugar, rubber, wood pulp, and a variety of agricultural products. In part, these raw-material resources supplemented deficiencies in our domestic resources, in part they were shipped to the United States for refining and subsequent re-export, and in part they never reached American shores at all, but entered foreign markets directly. But whatever the objectives in view, corporate management straddled national frontiers and began to exercise control over production and the channels of distribution on both sides of such frontiers.

Apart from the truly cosmopolitan reach of American industrial corporations in the field of raw-material production, the establishment of American-controlled manufacturing enterprises abroad calls for special consideration. This development was very rapid in the three decades preceding 1929, and was basically inspired by the desire to find the most profitable adjustment to the political and economic conditions of the world market. These enterprises fell into two broad categories: those producing primarily for the American market, and those producing for foreign consumption. As far as the first group is concerned (illustrated by American units in the Canadian pulp industry and marine foods industry, by cork factories in Spain and Portugal, and by jute factories in British India), their location abroad was dictated for the most part by the location of the foreign materials that they processed; judged by their contribution to the American economy, American investments in such manufacturing enterprises have been quite similar to the investment in foreign mines and plantations whose output supplemented a deficient domestic supply.

The situation with respect to the second group was quite different. Here are a group of expanding American industries whose ability to supply the domestic market was unquestioned, and whose competitive power in world markets was increasingly respected. Their decision to establish assembly plants and manufacturing subsidiaries abroad was motivated usually by a combination of various considerations, but most frequently centering around (1) cost factors, (2) tariff policies and other forms of restriction, (3) the national peculiarities and prejudices of ultimate consumers in foreign markets, and (4) patent exploitation and market control. In setting up assembly or finishing plants abroad, for

example, the savings in transportation costs were frequently an important consideration. Occasionally, the availability of cheap labor was a factor, though popular discussion has greatly exaggerated its significance. Meantime, foreign tariffs constituted a special kind of cost factor confronting the American manufacturer, and became a growing and more insistent element in prompting the decision to invest in productive facilities within protected markets. By producing in the Canadian market, for instance, better access could be gained to the greater part of the British Empire than by marketing directly from the United States.

In addition to the pervasive influence of trade barriers, American industry sometimes had to contend with other difficulties that could be overcome successfully only by producing on the spot. Consumer tastes and requirements in the foreign market were not always identical with those of the American market. The list of American products, such as automobiles, agricultural machinery, cash registers, and heating and plumbing supplies, which required some modification to fit the demand of the foreign market, was large.¹ Moreover, the American concern might have to contend with the factor of animosity to foreign products, sometimes played upon by organized propaganda to "buy British" or "buy German." Under such circumstances, its choice might lie between giving up the prospect of foreign sales altogether, or of adjusting itself to these conditions by production inside the foreign market.

The patent laws of certain countries have exerted some influence on the establishment of American subsidiaries abroad. For instance, the Canadian patent regulations of 1903, subsequently modified, declared a patent null and void after two years unless the patentee produced the patented product in Canada and made it available at a reasonable price. Apart from the quasi-compulsion of foreign patent legislation, there is evidence to suggest that American companies proceeded of their own choice to enter into patent agreements with their foreign competitors with a view to exerting some form of world market control for the sale of their products and to obtaining a voice in the system of international cartels and combines of Europe. The acquisition of minority interests in existing foreign companies has at times been the device used to cement such understandings. The evidence on this point is usually rather difficult to appraise, but, to say the least, it suggests the inference that the expansion of American industry abroad has lent added strength to the growth of corporate instruments of control over world products and world markets, instruments not previously existing in international economic society.

Brief mention should also be made of the development of international

¹ For a detailed discussion of this point, consult F. A. Southard, *American Industry in Europe*. New York: Houghton Mifflin Company, 1931.

cartels and combines, which appear to have become an important element in the control of international trade in the last quarter of the nineteenth century, when the rapid industrial growth of Germany raised new problems of international competition. At the outbreak of the First World War, 114 international combines and industrial agreements were known to be in existence, and the aftermath of the war saw a rapid resumption and extension of this trend.²

Though many of these cartels and combines were still of a restricted character, and frequently suffered from internal stresses arising out of the divergent interests of its members, it is likewise true that the trend to such integration and co-ordination of effort in respect to national and world markets was a process that had by no means run its full course at the outbreak of the Second World War. On the contrary, the attitude underlying private industrial agreements has repeatedly received the tacit or open approval of the public authorities, particularly in the field of internationally marketed raw materials. Rubber, coffee, tea, sugar, cotton, wheat, tin, nitrates, and potash may be cited as outstanding examples of commodities made subject to control schemes with active Governmental support in recent decades. National tariff policies and other governmental forms of import control have played an important part in buttressing private international industrial agreements. Relevant also in this connection is the previously mentioned Webb-Pomerene Export Trade Act of 1918, under the terms of which the United States Government permitted the organization of export cartels by American producers, thereby facilitating, as in the notorious case of Copper Exporters, Inc., the formation of an international sales cartel.

In general, it may be said that American business and the American Government alike have become frequent participants, if not leaders, in the efforts to establish instruments of control over world production and world consumption. What still remains in doubt, however, is the compatibility of such a mixed and uneven system of producer combines with the potentialities of world-wide expansion of production resulting from technical progress.

The American Merchant Marine

One notable aspect of the period after the War Between the States was the plight of the American merchant marine. In 1860, American ships still carried about two-thirds of our total ocean-borne foreign trade, but this figure declined to 10 per cent in 1914. A basic factor in this decline was the American policy of limiting the registration of the national merchant marine to American-built ships. This policy, laid down in the

²For a good general survey of international business combinations, see A. Plummer, *International Combines in Modern Industry*. London: Isaac Pitman and Sons, 1938.

law of 1789, began to handicap the American shipping business even before the War Between the States, when the initial advantages of low-cost materials in American shipbuilding disappeared. In the period following the war, this disadvantage became more pronounced with the displacement of wooden sailing vessels by metal sailing vessels and then by steamships. The unfavorable cost differentials arising out of construction were further enhanced by the comparative operating costs of labor, subsistence, and repairs. Under such conditions American capital showed a tendency to withdraw into the protected coastwise shipping lanes, or was invested in foreign ships.

The outbreak of the First World War appears to have opened a new phase in American shipping. The period was dominated by the huge shipbuilding program launched by the Government under the Shipping Act of 1916. Total American tonnage in foreign trade rose from about 1,000,000 tons in 1914 to 11,000,000 tons in 1921, of which the greater part was in Government hands. In the Act of 1920, the Government sought to lay down a long-range policy, the essential aspects of which were: (1) the sale to private enterprise of the Government's accumulated tonnage on extremely favorable terms, and (2) the establishment of Government-owned services on selected foreign trade routes, to be operated by private charterers. Under these conditions, the percentage of our foreign trade carried in American ships was maintained at considerably higher levels than before the war, varying between 30 per cent and 40 per cent. The policy failed to provide, however, for replacements of our merchant fleet, and with every passing year the total tonnage engaged in sea-borne trade continued to shrink. The White-Jones Act of 1928 was passed to remedy this situation; it provided mail subsidies for ship operators on a more generous scale than had ever been the case before in our history, and offered cheap loans for new ship construction. The act failed to stimulate any considerable amount of new construction, however, and the operation of the mail subsidy system, under which \$176,000,000 had been paid out by 1937, became the source of a public scandal.

A new start was made by the Merchant Marine Act of 1936. This legislation provided for comprehensive subsidies in shipbuilding and ship operation. The Government undertook to provide shipping companies with new ships at a cost not in excess of the cost of construction abroad. These ships were to be built in the United States, and the differential in cost of construction was to be absorbed by the Government up to one-third, and possibly one-half, of the American cost. Moreover, ship operators were allowed easy terms in paying for the ships. The ship-operating subsidies were to offset all differential cost advantages enjoyed by foreign shippers, including also Government subsidies paid to foreign competitors. The United States Maritime Commission was set up to

administer the act. If, in the judgment of the Commission, the interest of the United States required Government ownership and operation, it was authorized to proceed with such a program. The questions and doubts that were raised by the subsidy features of this act were pushed into the background with the outbreak of the Second World War in 1939.

The Triumph of Protectionism

The pattern of United States commercial policy in the latter part of the nineteenth century was fixed in substantial measure during the years of the War Between the States and the period that followed. The war marked a decisive turn in the history of tariff policy. During the 30 years preceding the outbreak of the war, there had been a partial reversal of the protectionist trend which had been evident in the period from 1816 to 1832. On the eve of the conflict, however, the final passage of the Morrill bill had set the stage for the rapid rise in rates that was to follow. The need for revenue became more urgent as the war progressed, and Congress responded to this need by setting up an elaborate system of excise taxes and greatly increased tariffs on imports. In part, the higher tariff rates were meant as an offset to the new internal excise taxes; but as the war progressed, protectionist aspirations and private cupidity likewise played their part in raising duties indiscriminately. The most extensive revision of the tariff occurred in 1864, when, after scanty discussion and under the stress of war, Congress passed a bill raising the average rate on dutiable commodities to 47 per cent, as compared with about 20 per cent in 1860.

For a period of nearly 20 years, this war tariff remained the basic public regulator of our foreign trade. The act was frequently amended, but the protectionist features of the legislation became more rather than less prominent as the war excise taxes were dropped, while tariff rates remained what they were. On several items, such as wool, steel rails, copper, nickel, and marble, the duties were raised. In 1872, a flat 10 per cent reduction in all protective duties was agreed to by the protectionist elements in Washington to head off a more drastic revision then imminent; but this proved to be a purely temporary reduction, because the earlier rates were restored in 1875. Ultimately the public ceased talking about the "war tariff" and adjusted itself by and large to the fact that the wartime expedient of extremely high import rates had become a permanent institution. As the foremost student of the American tariff reminds us, this new system fostered its own peculiar theory and dogma to justify its existence, and ideas that had been held to be the exploded errors of a small school of economists became the foundation of the policy of a great people.³

³ See F. W. Taussig, *The Tariff History of the United States*, pp. 174-175. New York: G. P. Putnam's Sons, 1931.

Throughout these years and subsequently, there were frequent occasions for renewing public debate over the tariff. Until the First World War, the tariff duties were the backbone of our Federal revenue system, and the varying fortunes of the public treasury offered many opportunities for suggesting changes in the tariff structure. Moreover, the remarkable growth of business combinations and the evidence of monopolistic practices greatly agitated the public mind, and these phenomena were frequently linked with the protective tariff. But on the whole, the protective system stood off these assaults, as in the general tariff revision of 1883 and toward the close of the first administration of President Cleveland, and even succeeded in moving to higher ground, as in the McKinley Act of 1890 and the Dingley Act of 1897.

In 1892 the election of Grover Cleveland for the second time seemed to give him a clear mandate for seeking the enactment of a lower tariff, but his intentions were frustrated in the Wilson-Gorman Act of 1894. Although this act temporarily checked the advance of protection and brought some reductions, the upshot was such a severe disappointment to the President and his followers that he allowed the bill to become law without his signature. The history of the entire episode of Cleveland's frontal attacks on protectionism has lingered on as a reminder of the great difficulties of securing congressional assent to a downward revision of the tariff.

The only serious interruption in the forward movement of the protective system was the passage of the Underwood bill of 1913. This act was a consequence of the unusual concatenation of circumstances that lifted Woodrow Wilson to the presidency of the United States and followed four years after the inconclusive Payne-Aldrich Act of 1909. The outbreak of the First World War in 1914, however, produced such abnormal trading conditions that the act never received an adequate trial. The aftermath of the war brought the disintegration of Wilson's national liberalism and a resumption of "normalcy" in tariff policy.

The legislation of the post-war decade consisted of three acts: the Emergency Tariff Act of 1921, the Fordney-McCumber Act of 1922, and the Smoot-Hawley Act of 1930. In these acts Congress turned its back upon those who argued that the time had come for a re-thinking of our international economic policies in the light of the changes which the war had brought in its wake, and rejected all responsibilities of leadership in international economic reconstruction. Instead, it reaffirmed the somewhat naïve faith that a policy of paying off all articulate economic minorities at home would somehow miraculously add up as the true national interest. It proceeded to raise rates to the levels of 1890, 1897, and 1909 and even higher, and extended the range of protection, particularly on agricultural products. The apex of American protective policy was reached in March 1930 with the passage of

the Smoot-Hawley bill, at a time when the world was turning into the most disruptive economic depression of modern times.

In reviewing the history of tariff policy during this period, little credence should be given to the exaggerated and sweeping claims in terms of which the subject has frequently been discussed. On the other hand, the purely historical record of the economic effects of the tariff yields only limited and tentative results, and makes necessary inferences based on generally accepted economic principles. Most students of the problem would agree that the policy of high protection accelerated the process of industrialization and, in particular cases, aided the establishment of branches of manufactures that subsequently were able to stand on their own feet.⁴ It would be wrong to conclude from such cases, however, that the policy of protection was a necessary prerequisite to the development of manufactures in the United States, or that a net increase in real national wealth and income was the result.

Another aspect of the question is concerned with the extent to which commercial policy harmonizes with the requirements of the international monetary system and the fulfillment of freely contracted international obligations. From this point of view, it might be argued that the protective tariff policy was not inconsistent with our status as a mature debtor nation in the period between 1873 and 1914. At any rate, the international financial position of the American economy required an export balance of trade in goods and services, and the protective tariff might have facilitated this by restricting imports. It cannot be proved, however, that the protective tariff was necessary for insuring this result, nor, indeed, that the tariff was responsible for it. The coincidence of our restrictive tariff policy and the requirements of our international financial position was probably more adventitious than planned. In the post-war period, however, the disparity between our growing creditor status and the intensification of our high protective policy threatened the breakdown of the network of international financial and monetary relationships, whenever the process of American capital export would be interrupted. This lesson has had to be learned by bitter experience.

The Quest for a "Scientific" Tariff

In practice, modern protection has been in some ways precisely the opposite of what its theoretical exponents pretended it to be. Their arguments have run in terms of the general national interest as distinct from private interest; but in reality the application of protection resulted mostly in placing at the disposal of organized special interests the instrumentalities of sovereign power to benefit themselves at the

⁴ See F. W. Taussig, *Some Aspects of the Tariff Question*. Cambridge, Mass.: Harvard University Press, 1931 (3rd enlarged ed.).

expense of other elements in the same national community. Down to the War Between the States, except for the Act of 1842, tariff acts were statutes running to less than ten pages. Under such circumstances, Congress could reasonably be expected to master the substantive content of the legislation and to devote its intelligence to a discussion of the general principles underlying it. After the War Between the States, however, a seemingly irresistible tendency to expand the detailed rate structure set in; the Smoot-Hawley Act ran to nearly 200 pages of print. What this really meant was that an expanding array of producer interests had attained well-nigh undisputed initiative in suggesting rates and writing the paragraphs of the act that concerned them most, while the role of Congressmen was confined to preserving the ceremonies of the democratic legislative process, working out compromises between competing pressure groups, and seeing to it that the sectional interests that they represented were appropriately recognized. Respectable elements in both political parties came increasingly to regard the prospects of new tariff legislation with a feeling of dread and embarrassment.

Such uneasy feelings ultimately crystallized in a set of affirmations that "the tariff should be taken out of politics," that the tariff should be made "scientific," and that a tariff commission should be set up to aid Congress in realizing these objectives. From as early as 1865 individuals and boards had occasionally been appointed to give temporary and limited assistance to Congress in its tariff-making duties. In 1909 a Tariff Board was created, but it went out of existence in 1912, when Congress refused to vote its appropriation. In 1916 a bill setting up a United States Tariff Commission was passed; it provided for a bipartisan, fact-finding body of six members, who were charged with duties of investigation regarding the operation of the tariff in its broadest sense. It was not, at that time, granted any powers over actual rates.

Meanwhile the so-called "scientific" principle of tariff making had been in its period of gestation. For many years party platforms had contained clauses declaring that a proper tariff rate was a rate equalizing differences in wages or in cost of production at home and abroad. Frequent repetition appears to have attached the odor of sanctity to this formula, and in due course of time it came to be known as the "scientific" principle of tariff making. In the Fordney-McCumber Act of 1922 Congress granted the President power to change individual tariff rates on recommendation of the Tariff Commission, provided the Commission found that the prevailing rate was in excess of, or below, the ascertained difference between foreign and domestic costs of production. This so-called "flexible provision" of the act limited administrative changes in the rates to 50 per cent of the congressional rates.

The operation of the Commission under its new powers proved a bitter disappointment to those who construed the flexible provision as

an important step in the right direction. Far from taking "the tariff out of politics," it put the Tariff Commission squarely in politics and made it the center of unsavory political intrigue. Outstanding tariff lobbyists were appointed to membership on the Commission as vacancies occurred, and severe pressure was brought to bear upon the Commission to prevent it from recommending a reduction in the existing duty on Cuban sugar. The futility of the new procedure was illustrated in this sugar case when President Coolidge refused to act upon the recommendation of the Commission that the duty be reduced from 1.76 cents to 1.23 cents per pound. As a fitting climax, Congress finally raised the duty to 2 cents per pound in the Act of 1930. All told, the Commission's recommendations in the period 1922-1929 led to 37 changes in individual rates, of which five were downward and the remainder upward. Such a trifling and unsatisfactory record justified the conclusion that the incorporation of the flexible provision in the acts of 1922 and 1930 was used by the high protectionist group as a device to deflect possible popular resentment over congressional logrolling tactics, and to gratify the aspirations for formal decorum in the rate-setting process. As long as the Commission was hamstrung in the exercise of its power over rates by the cost-equalization formula, the dominant protectionist group had its opponents blocked.

Commercial Treaty Policy

In order to understand the full implications of the shift in commercial policy that was in the making in the years following 1930, it is necessary to consider the role of commercial treaties in the shaping of commercial policy. From the beginning of our Federal history, the United States had pursued a tariff policy that left no discretion with the executive branch of the Government and that imposed uniform rates on particular imports, regardless of the country of origin. Such a policy is referred to as an *autonomous* tariff policy, as distinct from the policy of *conventional* tariffs (tariffs determined in the process of negotiating trade conventions). We stood aloof from the movement that swept Europe following the Anglo-French commercial treaty of 1860; this movement made bilateral negotiation of commercial treaties the vehicle for securing an all-around reduction of tariff barriers and joined this to an acceptance of the principle of equal treatment for all foreign goods. When the tide turned toward renewed protectionism in the last quarter of the nineteenth century, the sectional pressures for high protection, as registered in European parliaments, were checked somewhat by a continuation of this active commercial treaty policy, which left with the executive authority considerable discretion to modify rates in the course of negotiating trade treaties with other nations. There was also a disposition, notably in France after 1892, to become less open-

handed in pledging equal treatment in respect to all foreign imports and to pursue instead a more mixed policy, in which the same goods from different countries might be taxed at different rates. This was known as the "conditional most-favored-nation" or "preferential" policy, as distinct from the "unconditional most-favored-nation" or "equal-treatment" policy. Theoretically, the United States had adhered to the conditional most-favored-nation principle since 1778; but this had been of little practical significance, because we granted the same tariff to all comers as a matter of course and, on the other hand, encountered for most of the nineteenth century little disposition to withhold from our export goods unconditional most-favored-nation treatment. The predominance of crude materials in our export trade and the high repute of the equal-treatment principle in Europe were two factors contributing to this absence of discrimination. By the same token, however, the increasing importance of manufactures in our export trade and a new disposition to begrudge the grant of the equal-treatment pledge to nations who came to the conference table empty-handed raised in the United States a demand for a more active commercial treaty policy. Ignoring the special reciprocity treaties with Canada (1854-1866) and Hawaii (1875-1900), because they are isolated episodes or tinged with political implications, the issue was brought to the fore in this country during the last decade of the nineteenth century.

In the tariff acts of 1890 and 1897, the President was given power to place penalty duties on a small list of products on the free list, mostly South American products like coffee, to give him leverage to obtain special trade concessions for American goods. In 1897, the President was also empowered to reduce congressional rates on a small list of products, known as the "argol" list, and to offer tariff concessions on these products in exchange for special concessions or a promise of minimum tariffs abroad. Though a number of agreements were signed as a result of these provisions, the first policy is remembered primarily for the irritation it produced in Latin America, and both delegations of power to the President were too small to leave any perceptible imprint on trade. Of potentially greater significance was the delegation to the President of power to reduce any dutiable items in the Dingley Act by 20 per cent in the course of negotiating trade treaties with other powers. On paper this constituted a greater departure from our traditional procedure, but its practical significance was nil, because the so-called "Kasson treaties" negotiated under this provision of the Act of 1897 required Senate ratification by a two-thirds majority, and none had a chance of approval.

After these few half-hearted and futile gestures, there was no further disposition on the part of Congress to delegate to the President any power to reduce the congressional rates in the course of trade negotia-

tions until 1934, although the aftermath of the Spanish-American War did lead to special preferential tariff arrangements between the United States and Cuba and the Philippine Islands, respectively. The attempt to conclude a much publicized reciprocity treaty with Canada during the Taft administration failed, however, owing to Canadian opposition.

In 1922 Congress clarified one aspect of our international commercial policy when it came out with a straightforward declaration in favor of the principle of equal treatment. In conformity with this objective, the United States gave up the minor special favors it had for many years extracted from Brazil under the threat of a penalty duty on coffee, and emerged alongside England as the champion of the unconditional most-favored-nation clause. Although the active American sponsorship of equal commercial treatment was welcomed at first by a world so deeply divided and threatened with disintegration, it was also generally recognized that it was devoid of real economic and political significance as long as it was not implemented by a policy of trading concessions. With France a tariff war was narrowly averted when the French refused to sign with us an unconditional most-favored-nation treaty that would, in the French view, have given American products access to the French market on terms of the lowest duties that all the other nations combined had been able to secure in return for specific concessions to French products, while French products would receive in the United States merely a continuation of the "equally bad treatment" of the Fordney-McCumber rates. In retrospect it seems reasonably clear that our espousal of the equal-treatment principle in these years was mere lip service to an abstraction, which failed to come to grips with the real problem of world-wide economic restrictionism.

The passage of the Smoot-Hawley Act and the British policy of imperial preference in the Ottawa agreements of 1932 served to bring the equal-treatment principle to the lowest ebb of prestige in modern times. By quota and license systems of import control and foreign exchange control, hard-pressed debtor economies sought to escape the rigors of commercial frustration and financial chaos, and each step along this road was a step toward more complete anarchy in world economy. In the place of long-term commercial treaties, with their stabilizing influence on world trade, came an avalanche of makeshift trading arrangements, void of any general principle except "*saue qui peut*." The fiasco of the World Economic Conference of 1933 served to illustrate the extent of international economic disintegration.

The Trade Agreements Program

It was only after the failure of the World Economic Conference that the new trade policy of the Roosevelt administration took shape. In

1934 an amendment to the Act of 1930 was passed that reflected by implication most of the foregoing conclusions on our methods of shaping commercial policy. For a period of three years the President was authorized to enter into trade agreements with other nations and to reduce individual tariff rates by as much as 50 per cent in the course of such negotiations. These trade agreements were not subject to ratification by Congress and were to be based on the unconditional most-favored-nation principle. In making tariff reductions, the President did not need to consider himself bound by the cost-equalization principle of the Acts of 1922 and 1930. Congress renewed its delegation of power to the President in 1937 and again in 1940 and 1943.

The inauguration of this policy may be said to mark a turning point in the method of handling of our international economic policy, but it did not mean the abandonment of the policy of protection. On that score the professed fears of the protectionist groups in Congress were wholly unfounded. In the first place, Congress had set definite limits to administrative power; furthermore, the State Department and other agencies concerned with the program showed considerable caution in granting concessions in the 21 agreements signed prior to the outbreak of the Second World War. This cautious policy is illustrated, for instance, by the occasional use made of so-called tariff quotas to guard against a sudden, or sharp, increase of imports following a particular tariff reduction and by the employment of narrowed tariff classifications in granting some reductions. It became apparent that the administration was counting on the cumulative effects of a steady succession of carefully circumscribed tariff concessions over a period of years, rather than on a spectacular and drastic exercise of its power. Nevertheless, an appreciable modification of the American tariff level resulted. By January, 1939, 1,077 out of the estimated 3,200 rates in the American tariff schedule had been reduced, and nearly one-half of these reductions had amounted to from 40 to 50 per cent of the congressional rates. But many of these reductions were more impressive on paper than in their immediate economic consequences in stimulating imports. At any rate, the program appears to have been more successful in stimulating exports than imports, judging from the trade returns of the few years preceding 1939.⁵ With the outbreak of war in that year, our foreign trade and commercial policy were subordinated once more to the military and political exigencies of world conflict.

⁵ For detailed analysis and interpretation of the trade agreements policy, the reader is referred to:

G. Beckett, *The Reciprocal Trade Agreements Program* (New York: Columbia University Press, 1941); F. B. Sayres, *The Way Forward* (New York: The Macmillan Company, 1939); W. Diebold, *New Directions in Our Trade Policy* (New York: Council on Foreign Relations, 1941).

The Balance of Payments

The balance of international payments of the United States purports to measure, in terms of dollars, the total inpayments and outpayments across the frontiers of the American customs area in a stated period of time. By grouping the various items under relatively few headings, it is possible to secure valuable insight into the interrelations existing between our trade in commodities and services, our international capital transactions, and the flow of monetary metals. A knowledge of the changes occurring in the main subdivisions of the balance of payments over a period of time is an indispensable basis for the task of evaluating the logic and the timeliness of the international commercial, financial, and monetary policies of the Government. In the table given below, the essential relationships in the United States balance of payments over six successive periods from 1850 to 1940 are summarized.

TABLE 2
UNITED STATES BALANCE OF INTERNATIONAL PAYMENTS, BY PERIODS
(In billions of dollars)

	1850-73	1874-95	1896-1914	1914	Dec. 1919	1920-33	1934-40
	(24 yrs.)	(22 yrs.)	(19 yrs.)	(5 yrs.)	(14 yrs.)	(7 yrs.)	(7 yrs.)
Merchandise Exports	+6.6	+17.2	+32.2	+31.9	+59.8	+20.5	
Merchandise Imports	-8.1	-14.7	-22.9	-15.2	-47.6	-16.1	
Sundry Services	-0.3	-1.8	-7.2	-3.2	-11.4	-3.2	
Gold	+1.0	+0.1	+0.2	-0.8	-1.1	-15.2	
Capital Movements	+1.3	+1.0	+1.0	-15.6	-6.4	+7.1	
Interest Payments	-0.9	-1.9	-3.0	+1.8	+5.3	+2.4	
War Debts					+2.2		
Unestimated items and errors..	+0.4	+0.1	-0.3	+1.1	-0.8	+4.5	

(The data for the first four periods of this table are based on "The Balance of Trade of the United States," by C. J. Bullock, J. H. Williams, and R. S. Tucker, in *Review of Economic Statistics*, July, 1913, and *America's Stake in International Investment*, by Cleona Lewis (Washington, D. C.: Brookings Institution, 1933). For the last two periods, the annual balance of payments data of the United States Department of Commerce have been summarized. It should be noted that the figures for all items, except merchandise trade, are net. All date references are to fiscal years in the first three periods, and to calendar years in the last three periods. The gold account includes silver shipments in the periods 1850-1873 and 1934-1940.)

The period 1850-1914

Down to the outbreak of the First World War, the United States was a capital-importing nation; by 1914 the total foreign stake in the United States had risen to \$7,200,000,000. The process of building up this foreign investment had an oscillating character for most of the second half of the nineteenth century, in which periods of active investment alternated with years of partial liquidation of the newly acquired securities. This was particularly true in the first two periods covered by the table. In the third period, 1896-1914, the flow of new capital to the United States had a more even and sustained character, but in these years the great inflow of foreign capital was offset in part by the acquisi-

tion of foreign investments by American enterprise. It is estimated that the total American investments abroad had reached the \$3,500,000,000 mark by 1914.

As long as the annual interest and dividend payments arising out of the accumulated foreign investment were less than the new inflow of capital, the simple arithmetic of the balance of payments left the door open for an import balance in the trade of goods, services, and precious metals. On balance, this was actually the case in the first of the six periods shown in the table above. In the second and third periods, however, the annual outflow of interest and dividend payments normally overbalanced the net inflow of new foreign capital; such a transition is sometimes referred to as the change from the status of immature debtor nation to that of mature debtor nation. A mature debtor nation must find the necessary foreign exchange with which to meet its annual interest obligations either by exporting precious metals or by developing an export balance in its trade of goods and services. This is precisely what happened to the United States. Beginning with the fiscal year 1874, an export balance in merchandise became a characteristic of our foreign trade, and prevailed thereafter, with the exception of small import balances in the fiscal years 1875, 1888, and 1893. The export balance in goods was sufficient, together with small gold exports, to offset the balance of payment deficits arising out of shipping, tourism, and immigrant remittances and still leave enough to meet our international financial obligations. The unprecedented expansion of agricultural exports to Europe was a great factor in shaping the size of this export balance in the last quarter of the nineteenth century, and subsequently the export balance of trade was further enhanced by the rapid growth of our exports of manufactures.

The period 1914-1940

The period of the First World War brought a drastic overturn of the existing international financial relations of the United States. In the decades preceding the conflict, there had been occasional predictions that the United States would ultimately become a creditor nation, but these prophecies could hardly have been expected to foretell the rapidity and extent of the transition that took place. The character of the balance of payments during these years was determined by the needs of the Allied Powers for goods. Over the entire period from July, 1914, to December, 1919, the value of exports was \$31,800,000,000, or \$16,700,000,000 in excess of imports. Deducting the net debit balances on various service items, the active balance on goods and services came to \$13,500,000,000. To this credit balance, another \$1,800,000,000 had to be added for net interest payments to the American economy. Against this huge active balance stood a net gold inflow of \$800,000,000, and

the remainder had to be financed by the liquidation of foreign-held securities, by the acquisition of new foreign investments by Americans, and by United States Government loans to its Allies. The public loans amounted to \$9,600,000,000, and changes in the private capital account took care of the remainder. Estimates of America's international financial position in 1914 and 1919, respectively, sometimes show an even greater change than the foregoing figures would indicate, because the book values of the assets acquired on private account were frequently in excess of their actual cost. A study of recent data by the Brookings Institution gives the following estimate of American private investments abroad and foreign investments in the United States.

	<u>1914</u>	<u>1919</u>
Private American assets abroad	\$3,514,000	\$6,956,000
Foreign assets in the United States	7,200,000	3,985,000

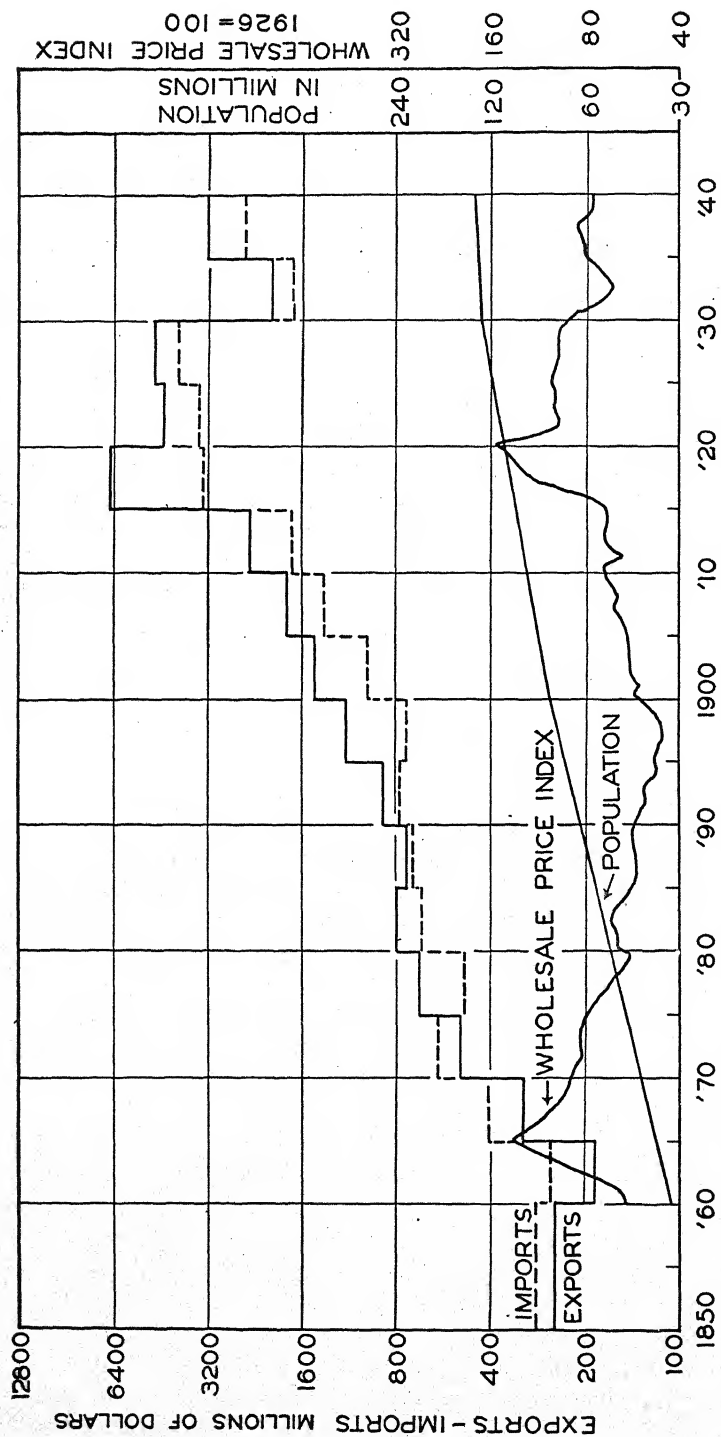
The two decades between world wars have been summarized in the fifth and sixth columns for the periods 1920-1933, and 1934-1940, respectively. The dividing line has been chosen as indicated because the net creditor status of the United States on private account appears to have been at its highest point at that time and a remarkable change in the capital account occurred since then. In the period 1920-1933, the total active balance on merchandise aggregated \$12,200,000,000, but this was largely offset by a debit balance of \$11,400,000,000 on various service items. War debt payments of \$2,200,000,000 and net interest and dividend payments of \$5,300,000,000 raised the total credit balance to \$8,300,000,000. The offset to this credit balance was supplied by a very rapid expansion of our net creditor status and by gold imports. The net gold inflow was \$1,100,000,000, and the net change in private capital account was in excess of \$6,000,000,000, to which another \$326,000,000 of United States Government loans in the year 1920 must be added. The actual investment in foreign securities and properties in the years 1920-1930 was greatly in excess of the foregoing amount, but the resumption of foreign investment in the United States partly cancelled out this larger total investment. After the collapse of 1929, a process of liquidation brought the total stake of foreigners in the United States and of Americans abroad to lower figures. In 1929, our total foreign investments have been estimated at \$17,000,000,000, exclusive of the so-called war debts, and foreign investments in the United States at \$8,900,000,000; in 1934, the figures are \$13,500,000,000 and \$4,900,000,000, respectively. The bulk of the \$800,000,000 in item called "Unestimated Items and Errors" is usually assumed to be the result of omissions and errors in calculating the capital movements.

The final period, 1934-1940, shows highly abnormal characteristics. The active balance on merchandise stood at \$4,400,000,000 for the seven-

year period. An import balance in the miscellaneous services of \$3,200,000,000 still left an export balance on goods and services of \$1,200,000,000. To this credit balance, another \$2,400,000,000 must be added for net interest and dividend payments. Under more normal circumstances than actually prevailed, the offset to these credit balances might have been found in a resumption of foreign investment by American interests, or in a liquidation of foreign holdings in the United States. But instead, the uncertainties of the world political situation and the demoralization of the world economy brought a major flow of capital funds to the United States. The net change in the capital account aggregated, according to the official figures, in excess of \$7,000,000,000, and the large item for errors in the estimates of \$4,500,000,000 meant that the net inflow of funds was in all probability several billions above this amount. Thus, from a balance of payments point of view, the offset to the large credits on current and capital account was found in an unprecedented inflow of gold and silver, jointly recorded as in excess of \$15,000,000,000. This colossal inflow of precious metals was a symptom and a symbol of the interrelated political chaos and economic frustration of the entire world.

Trends in Our Merchandise Trade

The general trend of our foreign trade from 1850 to 1940 may be studied in the semilogarithmic chart on page 572. The export and import curves of this chart measure the rate of change of export and import values over successive averaged five-year periods. A comparison between these curves and the line measuring the rate of American population growth by decennial years shows that the per capita value of exports and imports has grown fairly steadily, at least until the last decade. Generally speaking, the fluctuating appearance of the export and import curves since 1914 stands in rather striking contrast to the more even rate of growth in the preceding period of time. It must be remembered, however, that these relate to the value rather than the volume of trade, and that fluctuations in prices may cause the dollar value figures of trade to oscillate more sharply than the volume. It has been estimated, for instance, that in the years 1911-1914 and 1919, respectively, the quantity of our exports increased by 40 per cent, while the dollar value figures more than tripled. Unfortunately, the measurement of the quantity of trade is attended by considerable technical difficulties. The changing index of United States wholesale prices offers a crude device for correcting possible misapprehensions concerning the quantity significance of changes in the dollar values of foreign trade. A line representing the rate of change in the wholesale price index has therefore been included in the chart, and it suggests that the increase in the



Exports, Imports, Wholesale Price Index, and Population, 1850-1940.

volume of trade from the period of the War Between the States until the end of the nineteenth century was more pronounced than the value figures would indicate, because the trend of prices was consistently downward after 1865. On the other hand, part of the greater rate of increase in the value of trade since the closing years of the last century represents higher prices rather than increase in volume. In recent times, the United States Department of Commerce has published trade statistics in which the export and import values are corrected for price changes occurring in 265 leading articles of foreign trade. Thus they obtain an index number measuring the trend of exports and imports with the influence of price changes eliminated. Table 3 offers the results of this

TABLE 3*

INDEXES OF VALUE AND QUANTITY OF UNITED STATES FOREIGN TRADE, 1913-1940
(1923-1925 average = 100)

Yearly Average	EXPORTS		IMPORTS	
	Value	Quantity	Value	Quantity
1913.....	55	81	46	66
1921-25.....	96	97	89	94
1926-30.....	105	122	104	116
1931.....	53	89	54	98
1932.....	35	69	34	79
1933.....	37	69	37	86
1934.....	47	74	43	86
1935.....	50	78	53	106
1936.....	54	82	63	118
1937.....	74	105	79	131
1938.....	68	105	51	94
1939.....	70	110	59	108
1940.....	88	129	66	113

* *Statistical Abstract of the United States*, 1941, page 532.

procedure. Of particular interest in this table is the revelation that the quantity of import trade was, except for year 1938, as high, or higher, in the quinquennium 1936-1940 as in the period of prosperity prior to 1929, and that in 1937 it surpassed any previously attained high-water mark. The quantities of export trade likewise maintained themselves better than the dollar-value figures would lead one to expect.

The commodity composition of foreign trade

The pattern of products entering into our export and import trade during this period changed in a steady and persistent fashion. Tables 4 and 5 show these changes in the composition of our export and import trade, respectively, by averaged five-year periods. Three striking characteristics stand out in the export table. First, the relative decline in the importance of raw material exports. At the beginning of the period, these constituted three-fifths of total exports, largely by virtue of large exports of raw cotton. This proportion declined in the subsequent period, until in the final quinquennium, 1936-1940, crude materials ac-

counted for less than one-fifth of our total exports. Second, as crude materials lost ground, finished manufactures began their great and sustained rise to pre-eminence among our exports. From a modest 12 per cent of total exports in the decade preceding the War Between the States, they forged ahead until more than one-half of our total exports are accounted for in this category alone. This development becomes even more impressive when viewed in conjunction with the parallel rise in the exports of our semi-manufactures. Third, the history of foodstuffs in the export trade of this period appears to run in a broad cycle. The significance of crude and manufactured foodstuffs built up to a crest in the final quarter of the nineteenth century, and then gradually diminished in relative significance. The period of the First World War was marked by a temporary reversal of this downward trend, but it again became very marked in the final decade from 1931 to 1940.

TABLE 4*
PERCENTAGE DISTRIBUTION OF UNITED STATES EXPORTS BY ECONOMIC CLASSES,
1851-1940

<i>Yearly Average</i>	<i>Crude Materials</i>	<i>Crude Foodstuffs</i>	<i>Manufactured Foodstuffs</i>	<i>Semi- Manu- factures</i>	<i>Finished Manu- factures</i>
1851-60.....	61.67	6.61	15.39	4.01	12.32
1861-65.....	19.97	22.13	34.42	5.69	17.78
1866-70.....	57.62	9.05	13.75	4.68	14.89
1871-75.....	44.94	15.47	19.59	4.67	15.33
1876-80.....	32.24	23.93	24.39	4.55	14.87
1881-85.....	33.78	21.00	25.50	4.78	14.94
1886-90.....	38.13	14.98	25.01	5.52	16.36
1891-95.....	33.67	17.21	27.22	6.32	15.57
1896-1900.....	26.11	18.90	24.01	9.64	21.33
1901-05.....	30.27	12.19	22.16	11.30	24.07
1906-10.....	31.68	8.90	18.12	14.23	27.07
1911-15.....	30.74	8.83	14.32	15.41	30.70
1915-20.....	18.22	9.16	17.66	15.39	39.58
1921-25.....	27.54	9.74	13.93	12.45	36.33
1926-30.....	24.40	6.40	9.72	14.14	45.35
1931-35.....	30.23	3.85	8.83	14.51	42.57
1936-40.....	19.05	3.77	5.52	19.29	52.36

* *Statistical Abstract of the United States*, 1941, page 533.

As to imports, the statistical trends of crude materials and finished manufactures were the reverse of those described above for the export trade. Finished manufactures declined from one-half to one-fifth of total import trade, and industrial raw materials rose from 10 per cent to from 35 to 40 per cent of total imports. Years of business depression in the United States were likely to bring a temporary reversal of this trend and might yield a relative as well as an absolute decline in the figures for raw material imports, just as years of intensive industrial activity, as in the First and Second World Wars, accentuated the raw material character of our import trade. In years of normal business activity, the total value of imported crude materials exceeds the value

of exported crude materials by a goodly margin. Among the raw materials imported, either in the raw state or partly processed, the most important are rubber, wood pulp, hides and skins, furs, wool, silk, copper, tin, jute, petroleum, nickel, vegetable oils, and a variety of steel alloys, the latter of great strategic importance in industrial processes, though the quantities and values used are of relatively minor significance. The columns on imported crude and manufactured foodstuffs show a downward trend since the decade 1871-1880, which was reversed in the last decade. Imported foodstuffs include, in substantial measure, products that cannot be grown in the United States except at prohibitive cost, such as coffee, tea, cocoa, tropical fruits and nuts, as well as cane sugar, edible vegetable oils, and alcoholic beverages. In addition, sizable importation of various grains occasionally took place when crop failures in the United States, as in 1936 and 1937, made it profitable to import wheat and corn into the United States over the tariff wall.

TABLE 5*

PERCENTAGE DISTRIBUTION OF UNITED STATES IMPORTS BY ECONOMIC CLASSES,
1851-1940

<i>Yearly Average</i>	<i>Crude Materials</i>	<i>Crude Foodstuffs</i>	<i>Manufactured Foodstuffs</i>	<i>Semi- Manu- factures</i>	<i>Finished Manu- factures</i>
1851-60.....	9.63	11.70	15.43	12.50	50.74
1861-65.....	14.12	14.29	17.47	13.60	40.52
1866-70.....	11.71	13.23	19.93	13.87	41.26
1871-75.....	16.12	14.12	20.07	13.56	36.13
1876-80.....	18.55	13.16	21.49	12.45	29.35
1881-85.....	19.98	14.90	19.15	13.73	32.25
1886-90.....	22.65	15.77	16.49	15.76	29.33
1891-95.....	23.59	13.66	17.92	14.37	25.45
1896-1900.....	29.47	15.08	15.93	13.35	26.17
1901-05.....	33.38	12.92	12.36	16.65	24.69
1906-10.....	34.56	10.98	11.80	17.82	24.84
1911-15.....	34.91	12.80	12.56	17.37	22.36
1915-20.....	40.13	12.15	16.21	17.10	14.40
1921-25.....	37.40	11.09	12.99	17.66	20.86
1926-30.....	36.80	12.56	9.88	18.89	21.88
1931-35.....	28.91	15.61	13.73	18.72	23.03
1936-40.....	36.39	14.26	15.42	22.81	20.39

* *Statistical Abstract of the United States*, 1941, page 533.

The geographic distribution of foreign trade

The expansion of foreign trade and the changes in the composition of the exports and imports brought with them great changes in the geographic dispersion of our international economic contacts. Tables 6 and 7 bring out the extent to which the commercial relationships with different continents have changed with the passage of time. At the outset of the period under review, it is scarcely an exaggeration to say that our foreign trade was trade with Europe. Three-fourths of our exports found their market on that continent, and the rapid development

of food exports in the last quarter of the century raised this percentage even higher. But the European market could not maintain this position with the continued expansion of our exports, and a steady relative decline set in that had not yet run its full course in the decade 1931-1940. Even in this last decade, however, the European market accounted for over 40 per cent of our total export trade, far ahead of any other continent in its ability to absorb American products. On the import side, European trade likewise suffered relative diminution. This decline was not pronounced in character until the period of the First

TABLE 6*

PERCENTAGE DISTRIBUTION OF UNITED STATES EXPORTS BY CONTINENTS, 1860-1940

<i>Yearly Average</i>	<i>Northern North America</i>	<i>Southern North America</i>	<i>South America</i>	<i>Europe</i>	<i>Asia</i>	<i>Oceania</i>	<i>Africa</i>
1860.....	6.9	8.8	4.7	71.8	2.4	1.5	1.0
1871-75.....	6.4	7.2	4.0	80.2	1.0	0.8	0.4
1876-80.....	5.0	5.4	3.3	83.1	1.7	1.1	0.6
1881-85.....	5.4	5.7	3.6	81.1	2.2	1.6	0.5
1886-90.....	5.2	5.8	4.3	79.3	2.8	2.0	0.5
1891-95.....	5.5	6.8	3.7	79.5	2.3	1.6	0.6
1896-1900.....	6.9	5.6	3.1	76.7	3.9	2.3	1.5
1901-05.....	8.6	6.7	3.2	72.3	5.3	2.0	1.9
1906-10.....	10.2	8.7	4.6	68.2	5.5	1.8	1.0
1911-15.....	14.2	7.7	5.2	61.0	5.6	2.2	1.1
1915-20.....	12.0	7.7	5.5	63.2	8.6	1.7	1.3
1921-25.....	14.3	10.1	6.8	52.7	11.3	3.2	1.6
1926-30.....	17.4	8.4	9.4	46.8	12.0	3.7	2.3
1931-35.....	14.8	8.0	7.0	47.4	17.3	2.4	3.1
1936-40.....	16.2	9.0	9.8	41.4	16.6	2.8	4.1

* *Statistical Abstract of the United States, 1941, page 542.*

World War, when Europe's share fell from 50 per cent to 30 per cent and less. This sudden drop is partly explained by the influence of the war in causing the United States to establish direct trade relations with the Asiatic sources of supply in place of using European countries as intermediaries.

As American trade gradually swung free from its European orbit, the trade with other continents necessarily gained in relative importance. The Asiatic continent, with its important island fringe in Japan, the Philippines, and the Dutch East Indies, began to equal and even surpass Europe as a supplier of products for the American market, and has grown more rapidly than any other continental division in its ability to absorb American exports. Next to Asia, our commercial relations with Canada showed the greatest vitality. Here we are dealing with a vast area of rich resources, geographically contiguous and inhabited by people quite similar to our own in standard of living and consumption habits. The Canadian market has grown to the point where its annual share of American exports is almost equal to the amounts annu-

ally taken by all of Latin America, with a population roughly ten times as large as Canada. The South American areas, however, likewise accounted for growing percentages of our export trade, and they maintained their relative position in the growing import trade of the United States. Considered separately, the Caribbean area appears to have lost some ground relatively speaking, and South America, below Panama, held its own with the passing years. Finally, our trade with Africa and Oceania appears to be growing somewhat more rapidly than total trade, but the amounts involved are still very small.

TABLE 7*

PERCENTAGE DISTRIBUTION OF UNITED STATES IMPORTS BY CONTINENTS, 1860-1940

Yearly Average	Northern North America	Southern North America	South America	Europe	Asia	Oceania	Africa
1860.....	6.7	12.5	9.9	61.3	8.3	0.3	1.0
1871-75.....	5.9	16.6	11.0	55.6	9.7	0.7	0.6
1876-80.....	5.6	17.6	13.8	50.3	11.3	0.9	0.5
1881-85.....	6.3	14.4	11.4	55.1	10.5	1.7	0.6
1886-90.....	5.6	13.8	11.5	56.0	10.4	2.3	0.5
1891-95.....	4.6	16.3	14.9	50.6	10.8	2.1	0.6
1896-1900.....	5.0	10.3	13.2	52.6	14.6	3.1	1.3
1901-05.....	5.4	13.3	12.5	51.3	15.4	0.9	1.1
1906-10.....	5.9	13.4	11.7	51.3	15.2	1.2	1.2
1911-15.....	7.7	14.5	12.8	46.6	15.8	1.1	1.4
1915-20.....	12.7	17.5	17.6	20.3	27.1	2.1	2.7
1921-25.....	11.5	14.9	12.2	30.4	27.3	1.6	2.1
1926-30.....	11.9	11.4	13.5	29.9	29.7	1.3	2.3
1931-35.....	13.8	10.3	14.3	30.1	28.7	0.9	1.9
1936-40.....	14.9	10.0	13.6	25.3	31.6	1.4	3.2

* *Statistical Abstract of the United States*, 1941, page 542.

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CHAPTER 25

The Location of Economic Activity

THE MAP OF THE UNITED STATES today pictures a vast and elaborate network of communications linking major and minor centers of industry and trade. In contrast with the local self-sufficiency of earlier days, the outstanding feature of the present geographical pattern is interdependence. A specialized manufacturing center like Akron, or a financial center like New York, serves the entire country; and a community anywhere draws on distant places for many of its daily needs. Particular types of economic activity have their distinctive patterns of regional distribution, concentration or scatter, urban or rural habitat. Most important of all is the fact that these patterns are always changing.

Many of our most serious social problems have been and are associated with shifts in location. The modern metropolis with its difficulties of traffic congestion, land planning, and provision for public services represents a stage of evolution in response to new means of transport, production, and marketing. Poverty descends on whole regions as a result of depletion of resources or migration of industry. The economic and social stability of particular localities is profoundly affected by the degree to which they are dominated by single specialized lines of activity, and diversification is urged as a remedy. Regions and communities bid against each other for new industries, and in such matters as transportation rates, public power development, and wage regulation (to name only a few) the heat of controversy rages fiercest around the locational implications. Finally, a special series of locational problems is posed by the urgencies of a war economy, while those of the eventual post-war readjustment dimly take shape for the future.

The key to an intelligent approach to such issues lies in an understanding of the evolution of our present pattern of economic activity.

This pattern developed in a natural setting comprising the resources of climate, soil, forests, and minerals with which the United States was endowed, and topographic features, such as the Great Lakes and the Mississippi Valley, that ordained certain natural routes of transportation. Much of the economic, and indeed the political, history of this country can be explained in terms of these fundamental factors of con-

trol. It would be a mistake, however, to view this development solely in the light of such static factors, ignoring historical sequence.¹

In the first place, the direction from which settlement advanced exerted a profound effect on the later course of events. Some of the pre-eminence of the East in manufacturing may be traced to the fact that that region lay closest to the incoming waves of early immigration and closest to Europe. Still more important as historical factors are changes in methods of transportation, communication, and production. New techniques call almost inevitably for a new geographic layout of production. The significance of any resource is relative; for instance, that of a mineral deposit depends on its accessibility and the knowledge and will to utilize it. Among various types of technical development, it is, of course, the improvement of transportation that is particularly relevant to geographic change.

It is evident that the present location of our cities, farms, and factories is merely the outgrowth of a long evolution and cannot be explained adequately without historical perspective. The approach here will involve two stages: first, an analysis of the general principles determining location for any type of activity; second, the application of this analysis to the actual sequence of development so as to bring to light the basic causes of locational shift. In the brief compass of this chapter, only the most important factors can be considered.

General Principles of Industrial Location ²

For any activity (such as smelting iron ore, selling hardware, mining coal, or assembling aircraft), the relative desirability of possible locations hinges on two considerations: (1) the cost or difficulty of carrying on the process itself at any given location, and (2) the cost or difficulty of bridging the distances between any given location and its sources of materials and markets. For convenience one may refer simply to "production costs" and "transfer costs," respectively.

In some types of activity, considerations of production cost govern selection of a site. Thus, a gold mine is located primarily with an eye to minimizing the cost of extraction of the mineral, which will in turn depend on the richness of the ore and its accessibility from the surface.

Similarly, in some lines of manufacturing the place-to-place differentials in production costs may be so large in comparison with any possible

¹ A good example of the school of thought that overemphasizes the direct connection between natural resources and history is found in Ellen C. Semple, *American History and Its Geographic Conditions* (Boston: Houghton Mifflin Company, 1903).

² A somewhat more detailed discussion of locational theory will be found in E. M. Hoover, *Location Theory and the Shoe and Leather Industries* (Cambridge, Mass.: Harvard University Press, 1937). The fullest and best treatment is unfortunately available only in German, in August Lösch, *Die räumliche Ordnung der Wirtschaft* (Jena, 1940; Ann Arbor, Mich.: University Microfilms, 1942).

differences in transfer costs that they determine the location almost wholly. This is true, for instance, when a process requires some particular quality in local natural resources, such as climate or water. In such a case, the manufacturing operation shows a certain kinship to the extractive type of industry (mine, farm, or fishery) in that it exploits the nontransportational features of its site, and consequently the choice of its site is made with such features in mind. In still other industries labor costs (based on wage rates and productivity of labor) or tax rates are dominant factors in determining production costs and thus in determining locations. Finally, in settling upon the precise location of any activity within a local area, ground rent or land cost is often the dominant factor.

Most types of economic activity entail either bringing in a material or delivering a product or both, and their location is consequently influenced by access to sources of materials and markets. Access is, of course, not solely concerned with the mere carriage of commodities. The incentive to locate near a source of materials or a market is not merely a matter of tonnage or miles, but depends on the nature of the material or product, as well as on the type of transportation service available. Thus, the greater the distance between source and processing point of a bulky, fragile, hazardous, or perishable material, the more rapidly transportation costs pile up, and consequently the stronger the incentive to locate the processing point near the source. In considering the relative advantages of two different sources or markets not only must their distance from the place of manufacture be taken into account, but also the costs of carriage along the best route. A route that provides cheaper service, such as a navigable waterway, may be said to bring the points it serves "economically closer." Thus, iron ore from the upper Great Lakes ports is shipped several hundred miles by water to lower lake ports at a much lower cost than it could be shipped over a relatively short land route.

For products of a very perishable or bulky character, or those requiring close attention in their marketing, any location of the process not in immediate proximity to the market is out of the question. Ice cream is distributed over only a small area from any one plant. Daily newspapers must be printed within the city they serve, since speedy delivery (as well as speedy collection of local news) is essential for this highly perishable product. In order to maintain the close contacts required, manufacturers of style garments find it important to be located close to established market centers where buyers gather. The same condition is true, often in still greater degree, of businesses that render direct personal services, such as barber shops and hotels. Customers will come to them to receive the service, but not very far. Fifty yards may spell the difference between success and failure in the location of an estab-

lishment selling a convenience type of product or service that is bought "on the run."

Thus, the choice of a desirable location for any type of business is determined by weighing the relative advantages of possible locations in terms of differences in operating costs plus differences in the transfer costs that may be involved in collecting necessary materials and in marketing the product. In some businesses a single consideration may turn the balance, while in others the same factor may not apply at all. For example, access to materials is the major factor in locating canneries, but it is insignificant in most extractive and service industries.

Interdependence of Locations—the Pattern

All the foregoing considerations help to account for the location chosen by a particular producer at a particular time, but they do not adequately explain the general pattern. They do not reveal why any one kind of business is concentrated or scattered, nor do they account for such factors as rent and wage differences and the location of markets, which have been noted as determining the location of a given establishment and which also obviously result from previous location of other establishments. The over-all pattern of economic activity can be understood only in terms of interrelations among units of production.

Geographic interrelation among units of the same general line of production may be more familiarly described as concentration of production. It is sometimes economical to crowd all of the production of a particular commodity into a single large plant or a single district, whereas in other cases it is more advantageous to scatter production in small units.

Several benefits favor the clustering of production of a particular commodity in large plants. Units of highly specialized equipment or personnel in performing small parts of the job operate more effectively when the over-all rate of output employs each unit fully. The principle of insurance reduces the necessary margin of reserve stocks and the hindrances to output in a large plant, since breakages and other causes of delay are less likely to tie up a large part of the plant at any one time. Finally, the larger establishment can receive, handle, and market commodities in larger lots, thus generally at lower unit cost. It may, for instance, receive cheaper and more prompt service by purchasing its material by the trainload or shipload.

Analogous factors favor concentration of production into as few areas as possible. Thus, the close geographical concentration of the garment industry—despite the fact that small plants are involved—makes possible and in turn rests upon elaborate parceling-out of the processes of manufacture and distribution to minutely specialized manufacturers, factors, contractors, and subcontractors. In a smaller center such elab-

orate specialization could not be practiced because some of the subsidiary functions would be on too small a scale to keep a minimum-sized unit (say, one man, or one machine) fully employed. Skills and aptitudes developed in a specialized industrial center are another cumulative advantage offered by concentration to production cost.

The juxtaposition of different and even contrasting activities gives rise to economies of production on an even broader scale. A variety of economies of integration link together such related enterprises as blast furnaces and steel works, packing houses and glue factories, and even silk mills and coal mines (this combination on the basis of complementary labor requirements).³

Thus, a large business center can often provide more economical service functions than can smaller places. Interest rates have always been lower in large cities. The ready and flexible labor supply in a large, diversified employment center constitutes a powerful attraction, particularly for irregular and seasonal businesses.

Mention has already been made of the fact that concentration of production, through increasing the size of shipments, may result in some economies in transportation costs for the individual plant. Similarly, the cost of service is generally lower and its quality higher in a large industrial center than in a small one. This greater economy of the large center over the small arises from the fundamental fact that transportation itself benefits from large-scale economy, and that routes of heaviest traffic are generally cheapest. The consequent tendency to canalize traffic on as few routes as possible puts a special premium on locations at the junctions of heavy-traffic routes where low-cost and prompt service in many directions is available. This nodal feature of city location is a powerful cumulative force acting toward concentration.

In addition, a special incentive to concentration is extended to industries selling shopping goods—those in which the buyer likes to compare various offerings before choosing. In this case, buyers will prefer to shop in centers offering the largest possible variety of goods. Consequently, the best location for any seller to display his wares is next door to other sellers, in as large a center as possible. A large market becomes a Mecca for buyers and sellers alike, and so grows cumulatively larger. Thus, in some industries of a highly styled nature, virtually all the trade funnels through one district in New York City.

It is obvious, however, that there must be forces operating in the other direction—toward the dispersal of production in smaller plants and

³ For more specific information on such relations, see P. Sargant Florence, *The Logic of Industrial Organization* (London: George Routledge & Sons, 1933); Temporary National Economic Committee, Monograph No. 27, *The Structure of Industry* (Washington, 1940); and U. S. National Resources Planning Board, *Industrial Location and National Resources*, 1942.

more scattered locations. Actual trends of concentration or scatter represent approaches to equilibrium between the opposing forces.

The primary influence in favor of scatter is the fact that the resources on which many industries directly rest, and which all use at least to the extent of occupying land for standing room, are spread out over the surface of the globe. Most kinds of mining are spread out, in the sense that it is not economic to attempt to get the world's whole supply from a single source. To a much greater degree the agricultural potentialities of land are extensive—the possibilities of economically forcing greater and greater yields out of a particular plot of ground are decidedly limited. Even in the intensive use of land by manufacturing and office buildings, for which earth represents merely a place to stand on, there is a limit to the degree of spatial concentration. In general, the rental value of land is a measure of the intensity of competition among different users for a particular site; a highly desired site commanding a high rent will evoke a skyscraper superposing dozens of layers of use on the same ground area. For particular users, of course, the high rent serves as a sieve, keeping out all except those who can profit highly enough from such a location to be able to afford the high rent.

The fundamental reason for scatter, then, is the old principle of diminishing returns, which states that there is an economic limit to the concentrated exploitation of a natural resource. Since markets and sources of material are necessarily scattered to some extent, any processing industry settling in a centralized location would obviously be forced to rely on long hauls of materials or products or both. Despite the economies of large-scale transportation, this dependence on long hauls sets another limitation on the concentration of economic activity in general. Breweries are scattered because the possible economies of production realized from greater concentration would be more than offset by the inordinate added costs of delivery of the product. Newspaper production is similarly scattered in close conformity with the distribution of readers. Cheese factories and cotton gins are scattered because the mass-production economies of concentration would not balance the extra costs of bringing the perishable and bulky materials long distances. When iron was made with bog ore and charcoal, the same situation was true of the location of iron furnaces.

The location of population is dependent on the location of economic opportunities, because people actually tend to migrate in the direction of better opportunities.⁴ Mobility in this sense, however, is very imperfect, and at any given time the ultimate market and the labor supply—both important locating factors—are where the population is,

⁴ The best discussion of this tendency is in Carter Goodrich, ed., *Migration and Economic Opportunity*. Philadelphia: University of Pennsylvania Press, 1936.

not where it might like to be. Areas where employment opportunities fail to keep up with natural increase of population offer a supply of low-wage labor that attracts some types of manufacturing industry in which labor costs are large and skill requirements low. This condition has existed in our South and in rural territory in general.

Colonial America

Throughout America's pre-Revolutionary history the Colonies were oriented toward the sea, partly because settlement came from Europe, and partly because political, economic, and cultural ties with the Old World lingered. The New World settlements had been conceived and were administered not as a self-sufficient empire but rather as economic offshoots complementing and not competing with the economy of the mother country. Shortage of labor and capital reinforced this economic role, for production requiring much labor or capital could not easily compete with suppliers in the home country.

In an age when the technique of land transportation was no more advanced than the Romans had left it water carriage offered greater advantages than today. For this reason trade was largely coastal, and the interior country, away from water routes, operated with almost complete local self-sufficiency at a relatively primitive level.

It is readily seen that the trade of any economy and therefore the markets and cities tend to organize themselves along easy routes of transport (in this case, the coast and a few navigable rivers); while in areas where all transport is difficult and expensive all forms of production tend to be highly scattered and unspecialized. Neither resources of higher quality nor economies of larger-scale production could outweigh the terrific handicap of transportation cost imposed by the primitive state of overland transport. Virtually the entire white population was confined to a narrow fringe of settlements along the seaboard, centering about each harbor suitable for the small sailing craft that plied the coast and rivers. As shown in Figure 1, settlement in a century and a half spread inland only along the valleys of certain navigable rivers such as the Connecticut, Hudson, Mohawk, Delaware, James, and Savannah. The seats of government of all the Colonies were located on salt water⁵ and trade funneled through the ports. Village industries using hand or small-scale water power—gristmills, tanneries, cooperage

⁵ It is noteworthy that almost all these capitals were later moved inland to more central positions in their states. Among these moves were: Charleston to Columbia, S. C., 1790; New York City to Albany, N. Y., 1797; Philadelphia to Lancaster, Pa., 1799, and to Harrisburg, 1812; Portsmouth to Concord, N. H., 1808. Professor Derwent Whittlesey, in *The Earth and the State*, p. 521 (New York: Henry Holt and Company, 1939), stresses the political aspect of these shifts as representing a compromise between the divergent interests of the coastal and backcountry populations.

shops, and the like—and many industries later to graduate to the factory stage were carried on in the workers' homes. All but the simplest manufactured goods were imported from Europe.

The Improvement of Transportation

It is evident that the poor state of land transport was basic in determining the geographic pattern of occupations in the Colonial period,

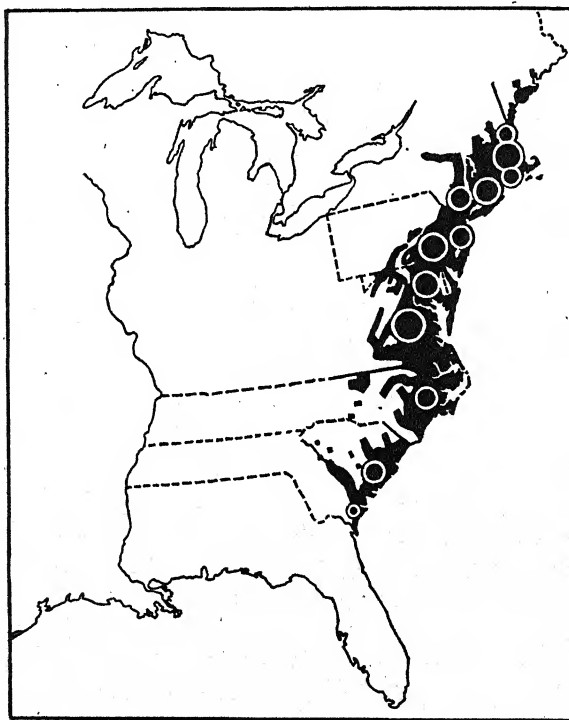


FIG. 1. Settled Areas, 1760, and Population, 1750. Shading indicates settled area. Volumes of globes (represented by circles) show the approximate populations of the several Colonies in 1750. Source: C. O. Paullin, *Atlas of American Historical Geography*. Washington, D. C.: Carnegie Institution and American Geographical Society, 1932.

characterized as it was by local self-sufficiency and small-scale production. The most significant factor of change in our geographical history was the improvement of inland transport.

This improvement, of course, did not take place all at once, but had been going on from the days of earliest settlement. Better highways, and eventually some canals, provided improved transport in the coastal region and opened up routes to the westward, while larger and better

ships put into the coastal and transatlantic service furthered the trend toward concentration of shipping in the larger harbors.⁶ Still later came the most important development of all, the railroad.

Transport made its greatest gains in six particularly active periods, each of which gave rise to increased activity in construction in general. These six periods began at approximately the following dates:

1830—Canals

1843—Eastern railroads—basic network

1862—Railroads—consolidation and integration of network

1878—Railroads—general

1895—Street and interurban electric railways

1918—Automobiles

It appears that the building cycle, a long oscillation in construction activity covering about 20 years, can be traced logically to the development of new industry, trade, and residence areas by transport innovations.⁷

Concentration of Industry

A most conspicuous trend during the larger part of the past century is that toward the geographic concentration of manufacturing industry in the United States. In this development cheaper and faster long-distance transportation by waterways and railroads played a major part. These new means of carriage made it possible to concentrate manufacturing on a large scale at some particularly advantageous point where materials or production costs were low, and to supply large areas more cheaply than local enterprises could.

Thus, the iron industry, once scattered through forest areas in small units and serving scattered markets, came to be concentrated in a relatively small number of establishments strategically located as to major deposits of materials and major markets. By the 1870's a large proportion of the nation's furniture was made in Grand Rapids; giant plants in a handful of Midwestern rail centers commanded the meat-packing industry; and Brockton shoes and Danbury hats were worn all over the world.

New means of freight transportation, however, were not solely responsible for this recasting of the geographical pattern. Cheaper transportation merely allowed the extension of markets. The opportunity of disposing of products *en masse* to wider markets provided an incentive for the adoption of revolutionary new large-scale methods of manufacture. Thus, about 1840, the American iron industry began,

⁶ The primary cause of this trend was the improvement of overland transport, enabling each port to serve a larger hinterland and thus ending the economic usefulness of the smaller and more poorly located harbors.

⁷ Walter Isard, "Transportation Development and Building Cycles," in *Quarterly Journal of Economics*, Vol. LVII, No. 1, November, 1942, pp. 90-112.

some decades after its British counterpart, the transition from local charcoal furnaces to large and more efficient coke blast furnaces. Pittsburgh's rise to pre-eminence in iron making depended not only on cheap materials and easy access to markets, but also on the economies of smelting iron in large coke blast furnaces. Similarly, the advantages of Chicago as a packing center would have been much less if village butchery methods had been used there. The highly specialized techniques that involve extracting and utilizing "all of the pig except the squeal" reduced the cost in the giant packing plants to a point where it was possible to compete with local butchers over a radius of hundreds of miles. Ingenious machines were indispensable in the development of specialized textile and shoemaking industries in New England serving nationwide markets.

Power machinery, the steam engine, the factory system of production, and standardized parts all played an important role in this development of concentration of manufacture on a mass-production basis; but all these were known before the railroad age, and had to await cheap inland transportation before their advantages could overcome the handicap of distance.

An indirect effect of the new emphasis on larger-scale production was a shift in sources of power. Mills of the pre-railroad age were mainly driven by water wheels located along small and easily harnessed streams that provided enough power for the small needs of a village industry. New England was particularly well provided with such small power sites. But as overland transportation improved, competition forced the adoption of still larger-scale and more highly organized production methods as well as location on a railroad or canal route. Many of the small early water-power sites could not fulfill these requirements—they were off the new routes, they furnished only a limited amount of power at one location, and the flow could not be controlled to meet production needs. At the same time, railroads and canals tapping the coal fields made cheap fuel more readily available. For all these reasons, larger steam-powered mills replaced many of those located at small power sites. Only in a few cases, as along the Merrimack River in New England, did water power fit in with the needs of the railroad age.

Somewhat analogous advantages led to the concentration of a number of similar plants in one community or area as soon as cheap transportation made it feasible. Several factors tended to make concentration cumulative, so that a community acquiring a certain reputation for production in a particular line became often more and more specialized and finally dominated the industry, as the industry dominated the community.

One such factor was labor supply. Acquired skills handed down from one generation to the next and attracting immigrant groups with similar

skills played a strong part in building up the shoe industry in New England, the clothing industry in New York City, the knitting industry in the Mohawk Valley and in southeastern Pennsylvania, instrument making in Rochester, the hardware and machinery industries in southern New England and later in Cincinnati and other Midwestern cities, and the jewelry industry around Providence. In many such cases the industry in question got a start in a particular area by mere chance rather than any reasoned selection, and further growth crystallized around that nucleus.

Another basis of cumulative specialization in certain lines was the development of highly specialized and centralized auxiliary and marketing services in larger centers. Thus, New York City became the fashion clothing market and Boston the shoe market for the country as a whole, while other large cities performed a similar function for more limited regions. Once these cities had been recognized as market outlets where buyers congregated to compare the wares of competing sellers, they logically became centers for the location of the sellers themselves and thus the foci of considerable clusters of the industry.⁸ Naturally this factor operated chiefly in industries in which the product has an element of individual variation or style, chiefly apparel industries. There is no particular incentive or necessity for buyers of a perfectly staple product to go to a single place to compare the wares of various sellers at frequent intervals.

By the end of the century, when the frontier was gone and the railroad net virtually completed, industrial specialization in particular areas, or localization of industries, had become so marked as to attract general attention. The Census of 1900 included a special chapter on the subject,⁹ pointing out the chief instances of extreme local concentration of particular industries and of specialized one-industry towns. Tables 1 and 2 list some of these.

It will be observed that the instances of extreme local concentration of an industry in Table 1 include some based on access to bulky or perishable materials (for example, canned oysters in Baltimore, wine in California, and naval stores in Georgia); others in which transport connections with both materials and markets are important (for example, coke,¹⁰ steel, and meat packing); and still others in which the

⁸ See Mabel Magee, *Trends in the Location of the Women's Clothing Industry*. Chicago: University of Chicago Press, 1930.

⁹ Twelfth Census, 1900, *Manufactures*, Part I, "The Localization of Industries." See also, for a pioneer discussion of industrial localization in this country, E. A. Ross, "The Localization of Industries," in *Quarterly Journal of Economics*, Vol. X, No. 3, April, 1896, pp. 247-268.

¹⁰ The coke industry furnishes an example of geographical shift as the result of technical change. In 1900 the beehive process was in use and the ovens were clustered around the Connellsville and other coking-coal deposits. The by-product process subsequently developed made it preferable to locate ovens near the market (that is, the blast furnaces), where gas can be used as fuel.

historical accident of an early start somewhere provided the nucleus for a cumulative concentration on the basis of acquired skill and reputation (for example, collars and cuffs, plated ware, clocks, whips, brassware, corsets, and shoes).

TABLE 1
CONCENTRATION OF SPECIFIED INDUSTRIES, BY STATES AND CITIES, 1900

<i>Industry</i>	<i>Leading State</i>	<i>Percentage of U.S. Total Value of Product</i>	<i>Leading City</i>	<i>Percentage of U.S. Total Value of Product</i>
Collars and cuffs	N. Y.	99.6	Troy	85.3
Plated and britannia ware .	Conn.	75.7	Meriden	32.8
Oysters, canning and preserving	Md.	65.9	Baltimore	64.4
Leather gloves and mittens	N. Y.	64.9	Gloversville-	54.2
Clocks	Conn.	63.5	Johnstown	*
Coke	Pa.	62.6	Connellsville	48.1
Safes and vaults	Ohio	61.3	*	*
Whips	Mass.	60.4	Westfield	*
Liquors, vinous	Calif.	60.1	*	*
Brassware	Conn.	54.1	Waterbury	47.8
Iron and steel	Pa.	54.0	Pittsburgh	11.3
Carpets and rugs, other than rag	Pa.	48.0	Philadelphia	45.6
Corsets	Conn.	46.0	Bridgeport	21.7
Boots and shoes, factory product	Mass.	44.9	Brockton	7.6
Agricultural implements .	Ill.	41.5	Chicago	24.5
Slaughtering and meat packing, wholesale	Ill.	40.1	Chicago	35.6
Turpentine and rosin	Ga.	39.9	*	*

* Data not available.

Source: Twelfth Census, 1900, *Manufactures*, Part I, Tables CXXXVII and CXXXVIII, pp. ccviii and ccix.

The specialized one-industry cities in Table 2 show the converse aspect of the same phenomenon of local concentration.

Decentralization Tendencies in Some Industries

Some industries tended to scatter again after reaching technical maturity.¹¹ There are many reasons for this procedure, which was particularly manifest in industries whose initial localization was founded on specially developed labor skills in certain localities. Labor became more and more mobile and spread such skills to the West and South. This happened, for instance, in the cotton-textile and shoe industries, where the migration of a few key employees possessed of special skill and knowledge was sufficient to set up a nucleus for the development of

¹¹ Useful references on trends of centralization and decentralization in particular industries include: Goodrich, ed., *Migration and Economic Opportunity*; Bureau of the Census and Bureau of Agricultural Economics, *Changes in Distribution of Manufacturing Wage Earners, 1899-1939*, by Harold D. Kube and Ralph H. Danhof (Washington, D. C., 1942).

an eventually large factory industry in a new region. Again, in the older centers the long persistence of an industry in a specialized community resulted in a strong organization of labor with great bargaining power,¹² and consequently a high labor cost. In many instances high labor cost reduced the profits of the industry, save for the more specialized grades requiring higher qualities of workmanship. In order to lower

TABLE 2
INDUSTRIAL SPECIALIZATION IN SELECTED CITIES, 1900

<i>City</i>	<i>Leading Industry</i>	<i>Wage Earners in Leading Industry as Percentage of Total in City</i>
South Omaha, Neb.	Meat packing	89.9
McKeesport, Pa.	Iron and steel	88.8
East Liverpool, O.	Clay products	87.4
Bethel, Conn.	Hats (fur-felt)	86.0
Tarentum, Pa.	Glass	81.1
Fall River, Mass.	Cotton goods	80.4
Charleroi, Pa.	Glass	79.1
Warwick, R. I.	Cotton goods	78.7
Brockton, Mass.	Shoes	77.4
West Hoboken, N. J.	Silk goods	76.2
New Bedford, Mass.	Cotton goods	74.9
Gloversville, N. Y.	Gloves (leather)	74.9
Kansas City, Kan.	Meat packing	72.7
Youngstown, O.	Iron and steel	72.6
Danbury, Conn.	Hats (fur-felt)	72.5
North Attleboro, Mass.	Jewelry	71.7
Haverhill, Mass.	Shoes	69.6
Troy, N. Y.	Collars and cuffs	68.7
New Castle, Pa.	Iron and steel	66.5
Lewiston, Me.	Cotton goods	64.3
Millville, N. J.	Glass	63.9
Johnstown, Pa.	Iron and steel	63.3
Gas City, Ind.	Glass	62.4
Johnstown, N. Y.	Gloves (leather)	59.6
Attleboro, Mass.	Jewelry	56.5
Manchester, N. H.	Cotton goods	55.8
Orange, N. J.	Hats (fur-felt)	55.2
Paterson, N. J.	Silk goods	52.8
Alexandria, Ind.	Glass	51.8
Lawrence, Mass.	Worsted goods	49.2
Cohoes, N. Y.	Hosiery and knit goods	42.5
Springfield, O.	Agricultural implements	35.6

Source: Twelfth Census, 1900, *Manufactures*, Part I, p. ccix. It should be recognized that such measures as this are highly arbitrary, depending as they do upon the delineation of separate industries and separate municipalities. For example, if South Omaha had been part of Omaha in 1900, it might not have appeared as a case of extreme specialization in this table; and a more detailed splitting-up of the iron and steel industry would also have removed some cases from the list as here given.

labor costs and gain freedom to follow new production techniques requiring less skilled labor, manufacturers of staple varieties moved out either to smaller towns or to completely new parts of the country, while those turning out a fancier product remained in the older centers.

¹² A strong labor group developed in the shoe industry, for example, because of the seasonal irregularity induced by cumulative specialization of the older and larger centers in the more unstable style varieties of the product,

Such a shift was made by the shoe industry, in which manufacture of staple grades of shoes was first to move toward the new Western centers and toward the small towns of upper New England, while that of the fancier styles remained in the older centers for a much longer time. In the cotton industry manufacture of cheaper grades of cloth migrated relatively early to the South, since for those grades the advantage of cheap labor and freedom to install new production methods in new plants was of the greatest importance and skill was least necessary. Production of the fancier grades, depending less on mass production and more on individual skill and training, remained longer in such Northern centers as New Bedford.

The tendency of many originally concentrated industries to scatter after attaining maturity may also be traced perhaps to financial causes. When an industry is young and highly speculative, it is likely to flourish only in some spot where it has happened to get local backing and its processes are not completely unfamiliar. After it has become an established industry with assessable risks, it is accorded entry into regional or national money markets, and capital ceases to be an important locational factor. Thus, many possible new locations are opened to it.¹³ This dependence on capital followed by freedom from its cares helps to account, for instance, for the early concentration and later scatter in the automobile and aircraft industries.¹⁴ In both these industries, of course, branch plants of concerns already well established in the original centers of concentration contributed to much of the later expansion in new areas.

Urbanization

Naturally enough, the concentration of particular industries in the nineteenth century was accompanied by a tremendous growth of cities, some of a specialized, others of a relatively diversified, character. The advantages of common transport terminals, pooled labor supplies, and general community facilities and services, such as those of financial institutions, help to account for the growth of cities. The decennial Census has so far regularly shown an increased proportion of the population living in urban places. Tables 3 and 4 adequately indicate the general trend, while Figures 2-6 show the locations of individual cities and the geographical pattern of urban population.

Urbanization brought advantages and disadvantages far transcending questions of costs, profits, and technical efficiency. The city—especially the industrially diversified center—offered a wider range of economic

¹³ An excellent discussion of this and related points appears in Glenn E. McLaughlin, *Growth of American Manufacturing Areas*. Pittsburgh: University of Pittsburgh, 1938.

¹⁴ An additional dispersive influence in the aircraft industry is the huge expansion that took place in 1940-1943 under conditions that counselled inland location for reasons of defense.



FIG. 2. Urban Population, 1790. *Source: National Resources Committee, Our Cities.*



FIG. 3. Urban Population, 1840. *Source: National Resources Committee, Our Cities.*

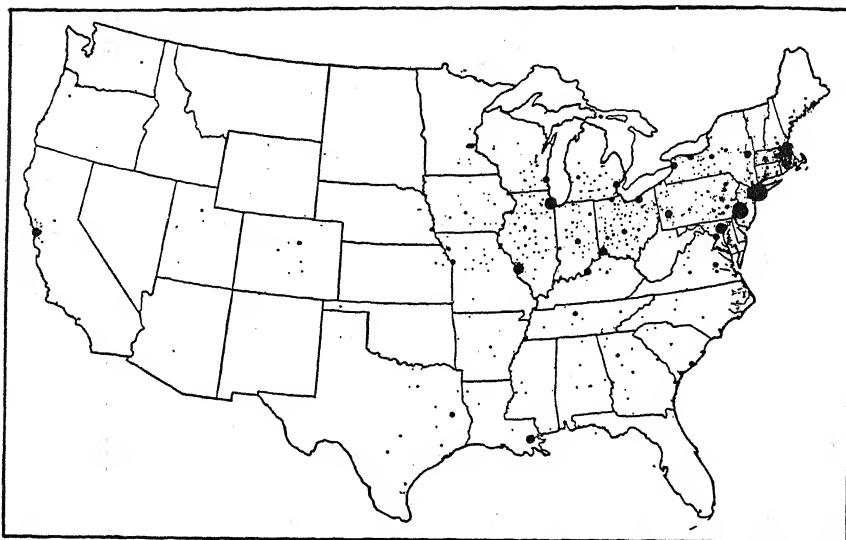


FIG. 4. Urban Population, 1880. Source: National Resources Committee, *Our Cities*.

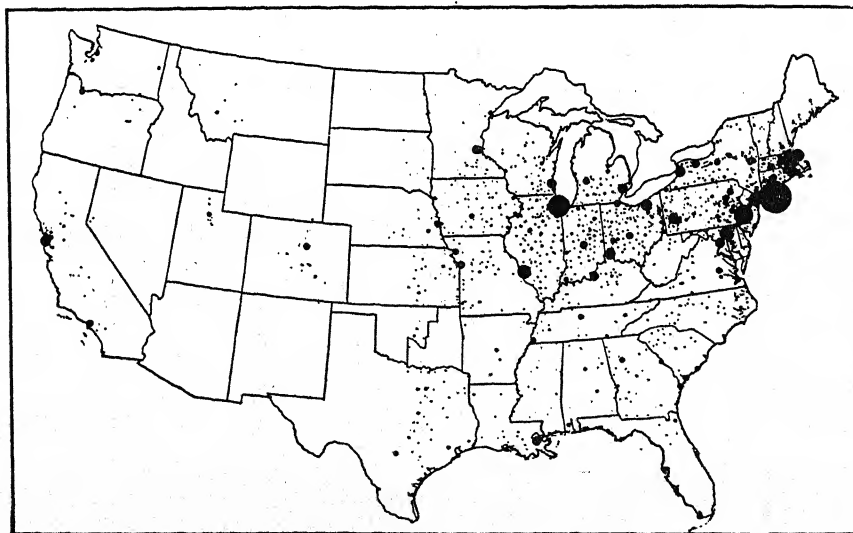


FIG. 5. Urban Population, 1900. Source: National Resources Committee, *Our Cities*.

and cultural opportunity, but also raised problems of social disintegration and control that challenged the foundations of democracy.¹⁵

¹⁵ See National Resources Committee, *Our Cities* (Washington, D. C., 1937), and R. D. McKenzie, *The Metropolitan Community*, (New York: McGraw-Hill Book Company, 1933),

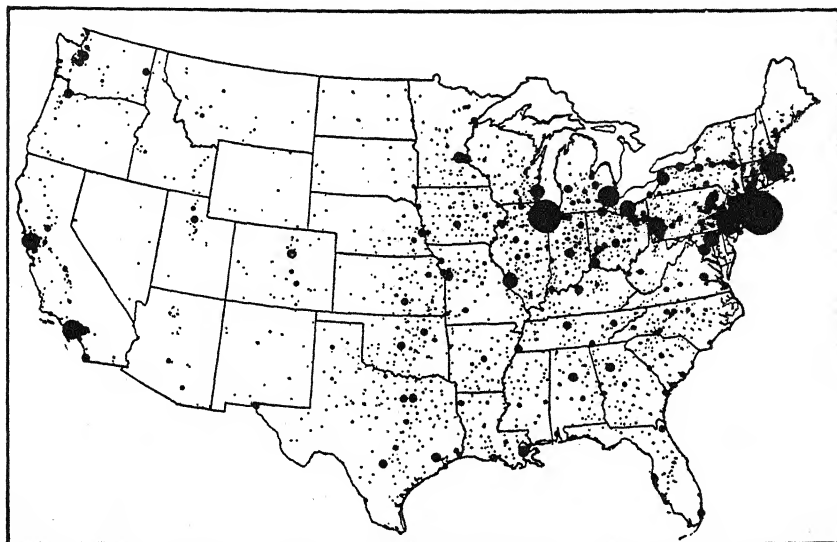


FIG. 6. Urban Population, 1930. Source: National Resources Committee, *Our Cities*.

TABLE 3

NUMBER OF URBAN PLACES OF 8,000 INHABITANTS OR MORE, AND PERCENTAGE OF TOTAL U. S. POPULATION LIVING IN SUCH PLACES, 1790-1940

Census Year	PLACES OF 8,000 INHABITANTS OR MORE		Increase in Per Cent of Total Population from Previous Census
	Number	Per Cent of Total Population	
1790.....	6	3.3	
1800.....	6	4.0	0.7
1810.....	11	4.9	0.9
1820.....	13	4.9	—
1830.....	26	6.7	1.8
1840.....	44	8.5	1.8
1850.....	85	12.5	4.0
1860.....	141	16.1	3.6
1870.....	226	20.9	4.8
1880.....	285	22.7	1.8
1890.....	445	29.0	6.3
1900.....	547	32.9	3.9
1910.....	768	38.7	5.8
1920.....	924	43.8	5.1
1930.....	1,208	49.1	5.3
1940.....	1,323	49.3	0.2

Source: Bureau of the Census, *Statistical Abstract of the United States*, 1941, Table 8, p. 6.

Electric Energy

The first really profound impact of electrical engineering upon location was the development of the trolley car, already noted as the basis of a major cycle of relocation and building commencing in the 1890's. This

TABLE 4

PERCENTAGE DISTRIBUTION OF POPULATION BY SIZE OF TOWN OR CITY,
1910 AND 1940

Population Size Group	PERCENTAGE OF TOTAL POPULATION	
	1910	1940
1,000,000 and over	9.2	12.1
100,000-999,999	12.9	16.7
10,000-99,999	14.9	23.6
Less than 10,000	63.0	47.6
Total urban (2,500 and over)	45.8	56.5
Total rural (less than 2,500)	54.2	43.5

Source: Bureau of the Census, *Statistical Abstract of the United States, 1941*, Table 7, p. 6.

improvement in local passenger transport accentuated the growth of urban centers and their extension outward along main arteries of traffic, giving our cities a tentacled shape. As we shall see, the automobile later radically modified this trend.

Electricity as a source of industrial motive power has progressed steadily until at present it far exceeds all other sources combined. As Table 5 shows, about 58 per cent of all motive-power capacity in factories is supplied by electric motors driven by purchased energy, and an additional 32 per cent by electric motors driven by energy generated in the

TABLE 5

RATED CAPACITY OF PRIME MOVERS AND ELECTRIC MOTORS IN MANUFACTURING PLANTS,
1899 AND 1939

Type of Equipment	Rated Capacity in Horsepower		Per Cent of Total Capacity of Prime Movers and Electric Motors Driven by Purchased Energy	
	1899	1939	1899	1939
All prime movers and electric motors driven by purchased energy	9,811,391	50,452,280	100.0	100.0
Steam engines and turbines	7,999,241	17,829,301	81.6	35.3
Water wheels and turbines	1,453,821	1,603,669	14.8	3.2
Other prime movers	180,153*	1,806,225	1.8	3.6
Electric motors driven by purchased energy	178,176	29,213,085	1.8	57.9
Electric motors driven by energy generated in reporting plant†	297,166	16,078,234	3.0	31.9
All electric motors	475,342	45,291,319	4.9	89.8

* Includes 47,192 horsepower reported as other owned power, not distributed by type of prime mover.

† Not included in the total on which the percentages are based, since this capacity is already counted under the head of the type of prime mover driving the generators.

Source: Bureau of the Census, *Statistical Abstract of the United States, 1941*, Table 864, p. 848.

plants. Although in most industries power costs are still a negligible factor in location, their importance is considerable in a few cases and is increasing.

The industries most responsive to the lure of low-cost power are those that use it for heating or to produce electrochemical reactions (heat-treating, artificial abrasives, aluminum, magnesium, caustic soda and chlorine, and ferro-alloys). The manufacture of a pound of aluminum from the oxide, for example, requires about 10 kilowatt-hours of energy. The rapidly increasing importance of electroprocessing means an important growth of industry in areas of cheap electric power.

One effect of the introduction of electricity into industry, which may still be in its infancy, is industrial development of regions, some of them previously nonindustrial, offering favorable water-power resources. Niagara Falls was one of the earliest major hydroelectric power resources to be harnessed, near the turn of the century, to industry; areas of more recent development include the Southeast (in particular the Tennessee Valley), the Columbia Basin (Bonneville and Grand Coulee), and the Colorado River (Boulder Dam). The St. Lawrence River is probably the largest single remaining hydropower site awaiting development.

The attraction of certain types of industry to these cheap power areas is of a different character, however, from the growth of industry at water-wheel sites in the early days of the factory age a century or more ago. Since electricity is transmissible for two or three hundred miles, and power rates are quite commonly not graduated according to distance from the generating site,¹⁶ the attraction now is to a region served by a power network, rather than to the exact point of origin of the power.

The character and layout of the individual industrial plant likewise have been modified by substitution of electricity for steam. Electric power can be purchased so conveniently that small factories are at less of a disadvantage than they would be if they had to set up a steam power plant. Energy flows through wires rather than along shafting and belts, so one reason for the old compact, cubical factory structure is eliminated. The modern electric-driven plant is more likely to be a spreading structure of one or two stories. Such a layout obviously calls for a more suburban location, which is now more feasible for other reasons as well. Thus suburbanization has been furthered by electrification, while in some industries the trend toward larger producing units has been halted.

The Automobile and Its Effects

The outstanding transport development of the last generation is, of course, the automobile (including the bus and truck). Its locational

¹⁶ Special rates are offered at some sites to very large users taking current direct before it goes in the transmission system.

effects were still far from being fully realized in 1941 when rubber and metal shortages forced a temporary halt and reversal of the trend. In looking to the future, however, it is reasonable to expect ultimate resumption of pre-war trends at even an accelerated rate.

It is significant that the automobile is particularly adapted to the short haul, in which the railroad made the least advance over previous means of transportation. Automobile transport, moreover, calls for a relatively small investment in fixed ways and structures. Highways are so much cheaper than canals or railroads that they can be built in far greater numbers and reach every community of any economic significance. In 1939 there were 233,670 miles of railway lines in the United States, and 2,912,283 miles of highways outside towns and cities: that is, 12 miles of highway for each mile of railroad.¹⁷ Although it is probably true that the unit costs of automobile transport are lower on highly developed routes of heavy traffic, this is a less significant factor than in the case of railroads, particularly since the costs of highway development are not generally assessed on a toll basis. The automobile, therefore, does not exert the strong funneling influence upon locations that the railroad does—big junction points do not possess as great an advantage in costs or quality of service.

Another feature of automobile transport is that the economies of large hauls are much smaller. It does not cost much less per ton to handle a shipment of 5,000 tons by truck than a shipment of 10 tons, whereas the difference by rail would be large and by water still larger. One of the advantages of concentrating production in large plants and around large terminals consequently disappears when truck transportation is substituted for rail. Finally, along any one truck route the stops are much more frequent than along a railway route, so that the number of possible locations for a plant is greater.

The motor truck, then, by increasing the number of locations to which satisfactory transportation service can be rendered and by reducing the differential advantages of large plants and of locations at major terminals, permits a much looser scattering of plants. The location of industrial establishments in and around cities is an indication of the working out of this effect at its height. Locations away from congested railway districts have become feasible, as have also the extensive specialization of parts manufacture and specialty subcontracting. The Detroit area is a good example. Trucks of many specialized types are used almost

¹⁷ Interstate Commerce Commission, *Statistics of Railways in the United States* (the figure here given represents miles of first track owned, excluding other main tracks, yards, and sidings). Charles L. Dearing, *American Highway Policy*, Appendix B, Tables 1-2, pp. 266, 269. Washington: Brookings Institution, Publication No. 88, 1941. (The figure given here includes state, county, and local roads outside towns and cities. Only about three-eighths of this mileage is surfaced.)

exclusively in shuttling back and forth across this huge industrial district carrying parts and subassemblies from one plant to another.

The locational effect of the automobile as a passenger carrier is best realized by keeping in mind that it can carry both the workman and the customer. Seasonal mobility of transient labor is of vastly greater importance since the advent of the automobile, and the migration of labor in search of new jobs is also increased. Differentials in economic opportunity between regions and between country and city will always persist but can be much more nearly equalized through this increased mobility of population.

Most important of all, however, is the effect of the passenger automobile on the structure of cities and metropolitan areas. When travel between home and work was by foot or on trolley cars or suburban railroads, factories and other establishments had to be located in the immediate vicinity of a labor supply or in a district easily accessible by public transit. Long tentacles of built-up territory extended out from the centers of large cities along the lines of public transit that furnished the only practicable means of journeying any great distance. The economic structure of cities was highly concentrated at the central nucleus where the various transit routes came together and the chief shopping and office buildings were located. The compact means of transportation developed a highly intensified usage of lines and building space within the heart of the city, and the advantage of transacting various businesses in close proximity furthered the trend of concentration.

Today our cities still follow the main lines of this pattern, but also show a quite different pattern that is gradually replacing it owing to the widespread use of passenger automobiles. For with the automobile came a vast increase in the mobility of labor, particularly in daily commutation. It became possible to locate a plant not merely with respect to the immediately surrounding labor supply or to that available by way of public carrier commutation, but actually to tap the labor supply of a radius of 20 to 30 miles around the plant. In any territory with reasonable density of population these possibilities created a potential labor supply sufficient for very large plants without any special care in location.

The fact that the automobile may be used to transport the buyer as well as the producer is revolutionizing the geography of retail-trade and service industries, as is manifest in the development of supermarkets and department store branches along main commuters' routes just prior to the outbreak of the present war. These new departures in location depended on the ability of customers to come by thousands in their own cars, which they parked in a specially provided lot adjacent to the supermarket. Without private automobile transportation such marketing

centers would in most cases be out of the question, as is amply demonstrated by the dismantling of many of them since the curtailment of automobile transportation.

Near the center of the city, conversely, the effect of the automobile was one of blight. With all its many merits, the automobile is still a great waster of space. Not only does it take up far more street space than public transit does in getting the traveler to his destination, but (being a private vehicle) it has to be parked somewhere to await the owner's return. Obviously, a vehicle so space-consuming is not well suited to serving the central areas of cities where space is at a premium. Equally obviously, the central parts of cities, built for an age in which street space requirements per person were much smaller than at present, make poor locations for catering to customers who find it convenient to travel by automobile.

Retail-trade and specialty-service establishments, and even some office buildings, have naturally moved out from the central districts. Together with the loosening of the ties of manufacturing and storage establishments through the use of trucks instead of direct rail connections, this transition explains the vexing problem of urban blight. Property owners, municipalities, and utilities are left with enormous investments in downtown facilities that under automobile-age conditions can perhaps never be utilized in such a way as to make a fair return on the investment.

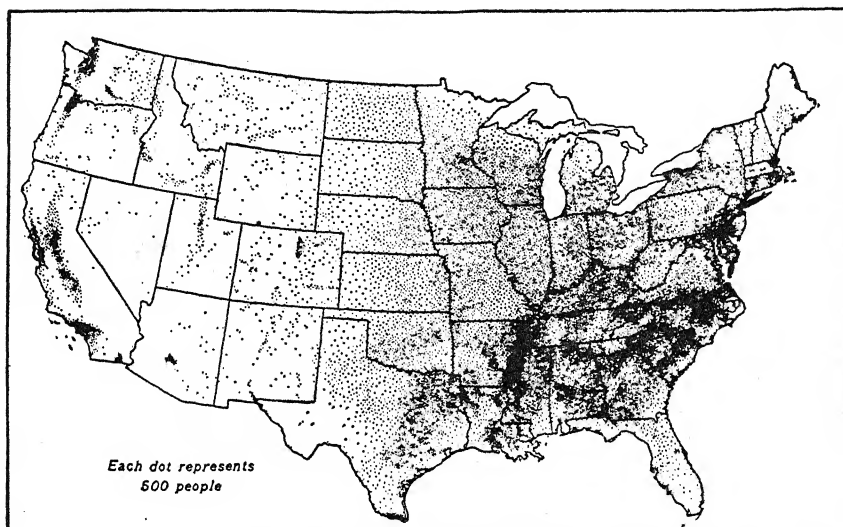
Changes in the General Pattern, 1899-1940

Tables 6 and 7 and the series of maps of urban places (Figures 2 to 6) point out the main over-all changes in the locational pattern during the last 40 years. Figures 7 to 12 show approximately the present distribution of the principal broad classes of economic activity—agriculture, manufacturing, mining, and trade—and the distribution of the population as a whole.¹⁸

The general drift to the westward is in evidence,¹⁹ as is the trend toward urbanization in metropolitan areas. Important factors in both movements have been the fast-growing new industries (automobiles, aircraft, and some branches of the chemical industry) that favored the Midwest, Southeast, and Pacific Coast.

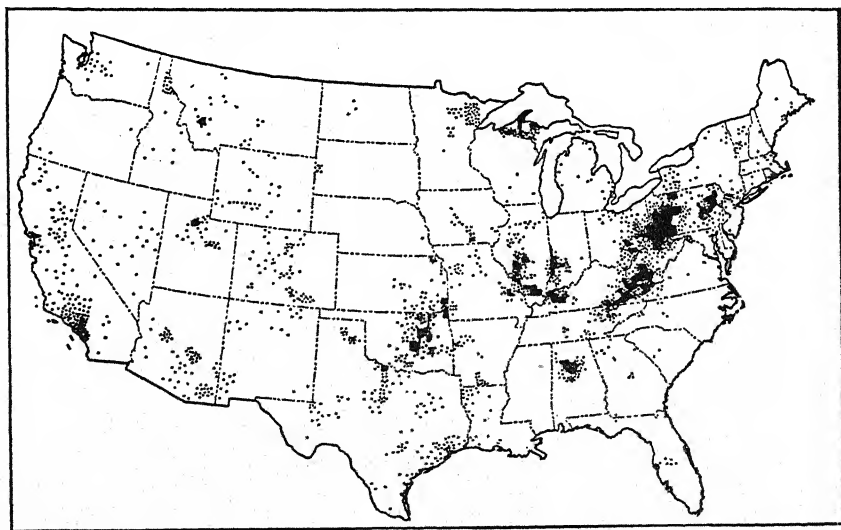
¹⁸ More recent maps are not available at present writing, but would show little change from those presented here for 1930 and later years.

¹⁹ There has been an uninterrupted trend toward interregional equalization of the density of population for at least 90 years. This trend is measured and graphically set forth in E. M. Hoover, "Interstate Redistribution of Population, 1850-1940," *Journal of Economic History*, Vol. I, No. 2, November, 1941, pp. 199-205. See also F. B. Garver, F. M. Boddy, and A. J. Nixon, *The Location of Manufactures in the United States, 1899-1929*. Minneapolis: University of Minnesota Employment Stabilization Research Institute, 1933.



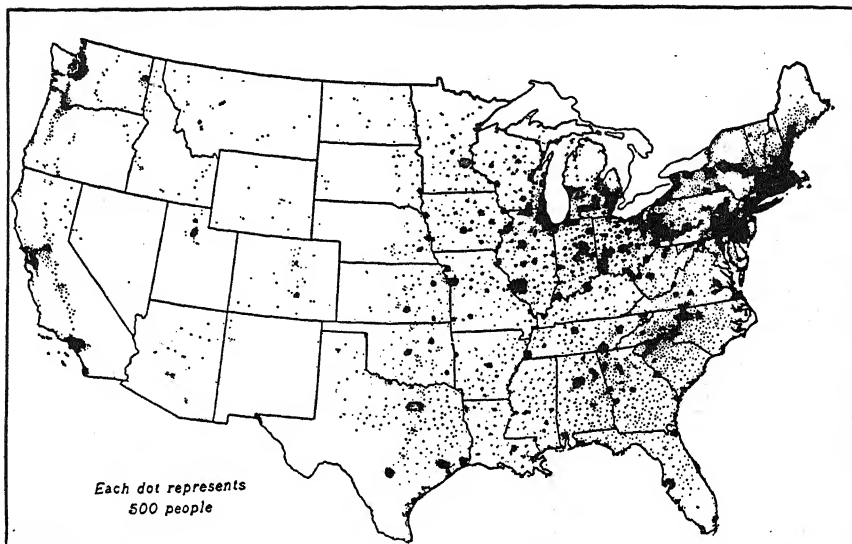
U. S. Department of Agriculture, Bureau of Agricultural Economics.

FIG. 7. Persons Engaged in Agriculture: April 1, 1930. *Source: National Resources Committee, Structure of the American Economy, Part I.*



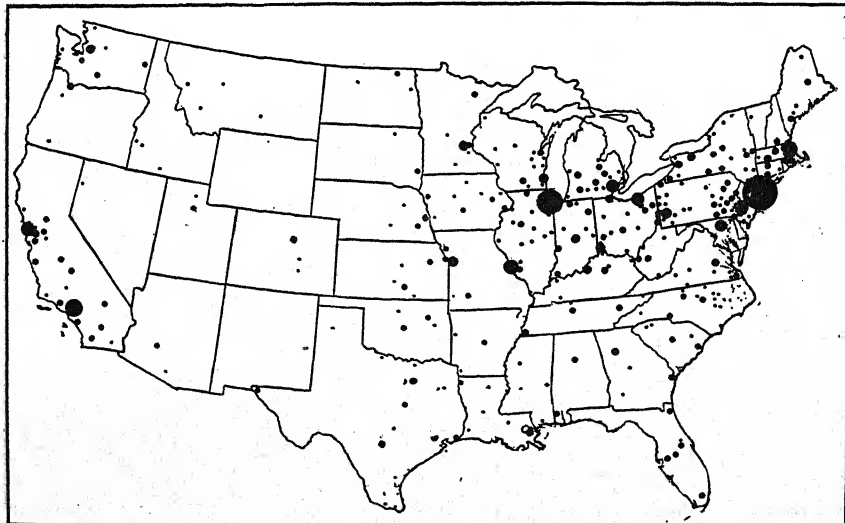
Bureau of Mines.

FIG. 8. Persons Employed in Mining, 1930. Each dot represents 250 persons. *Source: National Resources Committee, Structure of the American Economy, Part I.*



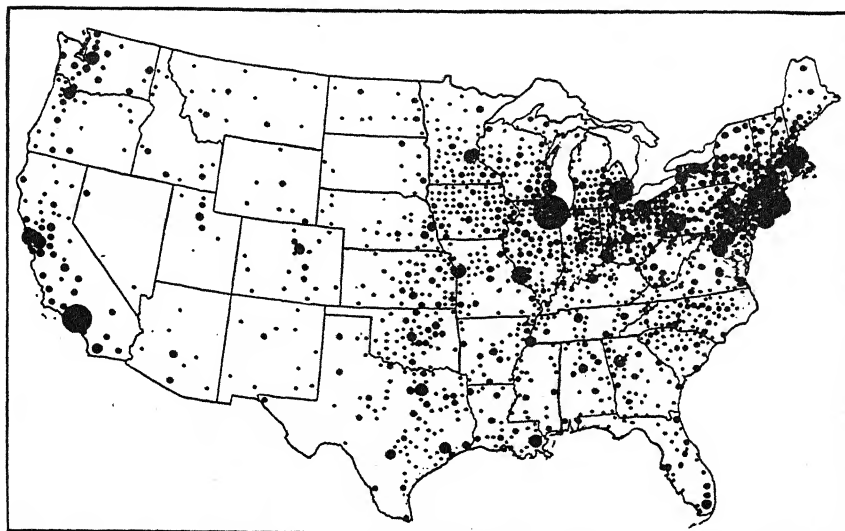
U. S. Department of Agriculture, Bureau of Agricultural Economics.

FIG. 9. Persons Engaged in Manufacturing, April 1, 1930. *Source: National Resources Committee, Structure of the American Economy, Part I.*



National Resources Committee. Census of Manufactures, 1935.

FIG. 10. Persons Engaged in Wholesale Trade, 1935. *Source: National Resources Committee, Structure of the American Economy, Part I.*



National Resources Committee. *Census of Manufactures, 1935.*

Fig. 11. Persons Engaged in Retail Trade, 1935. Source: National Resources Committee, *Structure of the American Economy*, Part I.

TABLE 6

DISTRIBUTION OF MANUFACTURING WAGE EARNERS BY REGIONS, 1899 AND 1939

Census Region	Manufacturing Wage Earners, as Percentage of U.S. Total		Percentage Increase in Number of Manufacturing Wage Earners, 1899-1939
	1899	1939	
United States	100.0	100.0	77.0
New England	18.1	11.6	13.8
Middle Atlantic	34.1	28.3	46.7
East North Central	22.8	27.5	114.0
West North Central	5.6	5.2	63.5
South Atlantic	9.7	12.7	130.7
East South Central	3.8	4.7	121.2
West South Central	2.4	3.5	156.7
Mountain	0.9	1.0	94.2
Pacific	2.6	5.5	271.1

Source: Bureau of the Census and Bureau of Agricultural Economics, *Changes in Distribution of Manufacturing Wage Earners, 1899-1939*, by Harold D. Kube and Ralph H. Danhof, Table 2, p. 25, and Table 5, p. 28. Washington, 1942. The original Census data have been adjusted to allow for changes in Census coverage.

Evidence of the character of the trend toward concentration in metropolitan areas is provided by Table 7. It is interesting to note that the relative importance of the major industrial areas as a group has not changed much since 1899—these areas still contain about 55 per cent

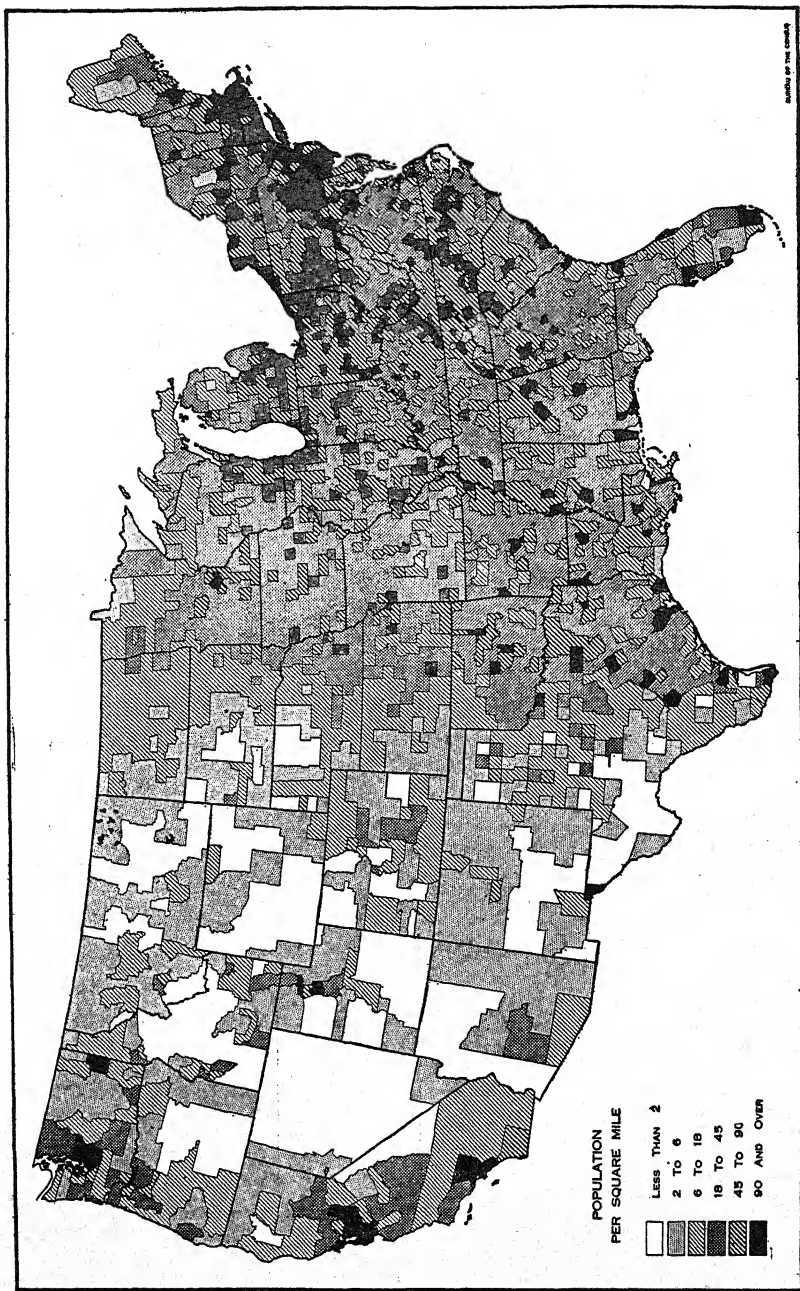


Fig. 12. Map of the United States Showing Population per Square Mile by Counties: 1940. Source: United States Bureau of the Census.

of the industrial workers—but that the same areas have an increasing share of the country's population (27.6 per cent in 1899 and 35.4 per cent in 1939). This means that the increased concentration of population in our major metropolitan centers is largely caused by an influx of

TABLE 7
PERCENTAGES OF TOTAL MANUFACTURING WAGE EARNERS
AND TOTAL POPULATION IN 33 INDUSTRIAL AREAS,
1899-1939

Census	33 Industrial Areas as Percentage of U. S. Total	
	Wage Earners	Population
1899	55.9	27.6
1919	58.2	33.0
1929	56.1	35.9
1939	54.6	35.4

Source: Bureau of the Census and Bureau of Agricultural Economics, *Changes in the Distribution of Manufacturing Wage Earners, 1899-1939*, by Harold D. Kube and Ralph H. Danhof, Table 10, p. 36.

nonmanufacturing activities, and that the distribution of population and that of manufacturing are coming into somewhat closer conformity. In 1899 the industrial areas had over three times as many industrial workers per 1,000 population as the rest of the country; in 1939, only about twice as many.

Within metropolitan areas the past 20 years have seen a rapid and progressive suburbanization of both population and manufacturing that has already been traced principally to the development of automobile transport.

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CHAPTER 26

The Changing Status of Labor

THE AMERICAN LABOR MOVEMENT has developed in the context of changing patterns of technology, business organization, social relations, and political power. The external evidence of the changing status of labor must not be allowed to overshadow persistent aspirations of organized wage earners. The following words from Daniel Weaver's address to miners,¹ on the eve of hostilities between the states, were at once a powerful plea for organization to improve the status of his associates, and an expression of the common objectives among trade unionists: "Our unity is essential to the attainment of our own rights and the amelioration of our present condition; and our voices must be heard in the legislative halls of our land . . . our objects are not merely pecuniary, but to mutually instruct and improve each other in knowledge, which is power; to study the laws of life; the relation of Labor to Capital; politics, municipal affairs, literature, science, or any other subject relating to the general welfare of our class."

The coal industry, which has furnished many of the most spectacular and bitter disputes and much of the leadership of the labor movement, provides a typical demonstration of the interaction between Weaver's sentiments and technological and institutional developments. Coal was mined in the sixties largely without the benefits of steam power; a miner was judged by his skill with a pick. In analogy with the putting-out system in textiles, miners bought much of their equipment and supplies and were paid according to the amount of coal delivered at the mouth of the mine. In these circumstances, they were concerned with the true weight of coal mined, since weight determined their income, and with reducing the number of accidents. The competitive position of mines, drastically altered by the emerging railroads of the 1850's, tended to exert a decisive influence on wage rates. The isolated mining community under company control restricted united action. But vast changes were soon to take place in the technology of coal mining and in the competition among regions and between coal and new forms of fuel and power. The organization of coal miners, first locally, then regionally, and finally on a national basis, grew out of these conditions and developments.

The directions and patterns of change in American economy as a

¹ Edward A. Wieck, *The American Miners' Association*, pp. 217-219. New York: Russell Sage Foundation, 1940.

whole are seldom so clearly spotlighted as against the backdrop of labor relations. The evolving structure of market organization, the role of government, technology, the changing conceptions of the law, fluctuations in national income, employment and standards of welfare, and the basic beliefs of the community are all dramatized as they are focused upon wage earners. But the status of "labor" must not be viewed as derived or passive; the workingman's quest for social position, community recognition, larger income, and greater security have constituted one of the more dynamic social forces of the period.

Among the inarticulate premises from which this survey of labor's status proceeds is the necessity of viewing human behavior in groups. Moreover, emphasis must be placed on the interrelations among four groups of factors: technical influences such as engineering and geographic and biological conditions; the impact of market and more narrowly economic factors; community organization and power relations among groups; and the beliefs and prevailing ideas of a community. The evolution of the American labor movement cannot be understood without weaving these four strands together. The first three sections of this chapter depict the emergence of organization, the growth of national unions, attempts at federation, and the era of the Knights of Labor. Sections four and five digress from the historical narrative in order to view particularly the market and framework of technology and to investigate the internal constitutional organization of the labor movement. The next two sections return to the narrative of the growth of the American Federation of Labor and the rise of the Congress of Industrial Organizations. A final section is devoted to the influence of ideas and beliefs on the changing status of labor in the American community.

The Emergence of Organization

Even in the absence of labor unions, wage earners cannot be viewed simply as isolated individuals. Workers are never unorganized. Whenever people work together, there develops within the workshop a community with its own informal leaders and spokesmen, standards of conduct and performance, a normative definition of a day's work, and various means of enforcing compliance with the group standard. The customary forms of group pressure are used against those who impart information unnecessarily to the foreman (the squealer), those who work well above or below the group standard (the rate-buster or chiseler), or those who in other ways threaten the security of the work community. It may be presumed that before formal organizations made their appearance, informal groups of workers used these pressures for common objectives.

The local trade-union in its initial stages can be viewed as a crystallization of these informal arrangements. Sometimes formal organization

is dramatically precipitated by some arbitrary act of management such as a discharge, a wage reduction, the introduction of a machine, or the bringing of a woman into a "man's job." Thus, the organization of Hart Schaffner & Marx in Chicago followed the famous 1910 strike, immediately precipitated by a wage cut on seams from 4 cents to 3 $\frac{3}{4}$ cents. Sidney Hillman emerged from the strike to become the first president of the Amalgamated Clothing Workers, organized in 1914. At other times development has been more gradual. The organizational drives of the United Steel Workers of America (CIO) have "consciously sought out the leaders of these informal groups throughout the plant, interested them in taking a lead in forming the union, and found that their joining the union invariably caused the members of the informal organizations to follow suit. In labor-union parlance these leaders are called 'the men with a following.'"²

Not all workers have been equally susceptible to unionization nor have all attempts at unionization been equally successful. As a first approximation, the development of organization is to be explained in terms of the position of workers both in a market system and in relation to a technological process.³ The combined strategic power of groups has varied widely. Some workers have been able to close an entire plant, or to inflict great loss, by possession of a scarce skill, by reason of their location in the flow of operations, or because of their control over perishable materials or product. Thus loom fixers in weaving, teamsters who deliver materials or finished goods, cutters in clothing,⁴ and those who soak hides in the leather trade all occupy extremely advantageous positions simply by virtue of technology. Other workers have strong bargaining power as a consequence of location in a market structure; their advantage may be at the expense of other factors (including different types of labor) hired by the enterprise, or may spring from the position of the enterprise in the product markets. Clearly the financial condition of a firm and its ability to pass along cost increases materially influences the return employees can expect. The bargaining power of wage earners depends upon their strategic position in dealing with the firm, and the strategic position of the firm depends in turn upon its dealings with the rest of the market mechanism.

² Clinton S. Golden and Harold J. Ruttenberg, *The Dynamics of Industrial Relations*, p. 182. New York: Harper and Brothers, 1942.

³ The place of wage earners in the legal system and the wider values of the community must also be kept in mind; these factors are examined in a later section.

⁴ Cutters took the lead in early organization of garment workers. For instance, the Sons of Adam was set up in Philadelphia in 1870. Uriah S. Stephens, who organized Assembly #1 of the Knights of Labor, was a cutter. Local 10 of the International Ladies' Garment Workers dates back to the mid-1880's, prior to the organization of the International. See: James Oneal, *A History of the Amalgamated Ladies' Garment Cutters' Union, Local #10, Affiliated with the International Ladies' Garment Workers Union*. New York: Local #10, 1927.

Formal union organization is more likely to emerge first in strategic groups, defined in terms of the market and technology, than among the most depressed or exploited wage earners. For this reason, local groups of strategic wage earners, first drawn from a single plant and then from the community, organized the first unions. Only later were national unions formed, under the influence of a growing national economy and guided by leadership with vision beyond local problems. Undertaking of an organization drive by a national committee, without local members, is primarily a development of the 1930's.

Emergence of National Unions

Local unions are combined into national⁵ or international bodies, which in turn may be allied into a federation like the A. F. of L. or the CIO. Local unions of hand typesetters, in a strategic position by virtue of technology, formed the oldest existing international union under the impact of market forces. The first principle urged in the "Address Issued by the Convention of 1850" provided for "an understanding in the regulation of scales of prices in different localities so that those in one place may not be permitted to become so comparatively high as to induce work to be sent elsewhere."⁶ The national organization was also to deal with the problem of transfer of members among cities, uniform standards of apprenticeship, and "scabs" or "rats."

The fifties saw the emergence of other national unions: the Molders', the Hat Finishers', and the Blacksmiths' and Machinists'. The pace of unionization in the sixties was more rapid under the stimulus of the War Between the States. About 20 national groups were organized, including the American Miners' Association, Locomotive Engineers', Conductors', Cigar Makers', Plasterers', Carpenters', Bricklayers', Painters', Spinners', and Shoe Workers' (Knights of St. Crispin). Ten of the nationals alone were formed in the period of rapidly rising prices and labor market shortages in 1863 and 1864.

The era of rapid expansion of national unions reflected the growing railroad systems, their impact upon competitive conditions among firms, and the mobility of craftsmen. A national transport system brought many firms into competition for the first time. Comparative costs became of greater importance. Relative wage scales, apprenticeship rules, and working standards among locals were the province of a national union if locals were not to compete with each other. Regional and national employer organizations emerged to stimulate the growth of

⁵ The difference between a national and international union in most cases depends upon whether the union has Canadian locals.

⁶ Ethelbert Stewart, *A Documentary History of the Early Organization of Printers*, Appendix A, #10, p. 135. Indianapolis: The International Typographical Union, 1907.

national unions. Issues of national legislation, such as immigration and free land, became more important. The evolving technology of larger enterprises tended to identify more clearly some crafts which had been undifferentiated from handwork. The emergent national unions were sometimes really regional, since the industry or the unionized firms were geographically concentrated.

Shoeworkers were particularly influenced by the general introduction of the pegging machine perfected by McKay. The "green hands" menace was the key to the meteoric career of the Order of the Knights of St. Crispin, the largest union in the country in 1870. The iron molders, skilled craftsmen whose employment was mainly concentrated in the stove industry, had formed a loose federation with advisory functions in 1859. The success of the molders, resulting from wartime conditions and the energy of the union's president, William H. Sylvis, encouraged the founding of first national employers' association. The union countered with a more centralized control to conserve its strike funds. Against the employers' association Sylvis, probably the most outstanding labor leader of the sixties, insisted that the union was not "to be bought with gold, scared by a loud noise nor whipped with the traces of falsehood and willful misrepresentations of the most corrupt newspapers on the face of the earth."⁷ Meantime, engineers on the railroads were in a strategic position to organize local unions. The consolidation of railroad companies and the general tendency to substitute piece rates for time rates served to precipitate in 1863 the Brotherhood of the Footboard (a year later renamed the Locomotive Engineers). Many influences peculiar to a given trade or industry thus served to shape the basic forces making for the amalgamation of local unions (focal points of maximum strategic location in a system of markets and technology) into national organizations.

The formation of national unions suggested a unifying federation treating problems broader than those of a single craft. Trade-unionists were joined by social reformers of all shades, each with his program. For example, Ira Steward, a member of the Machinists' and Blacksmiths' Union, was a zealot for the eight-hour day. "Meet him any day . . . and although he will apologize and excuse himself if you talk to him of other affairs, . . . if you only introduce the pet topic of 'hours of labor,' and show a little willingness to listen, he will stop and plead with you till night-fall."⁸ Called the "eight-hour monomaniac," Steward proposed the hours of work be reduced by legislation from the prevailing ten or eleven a day. Although the legislatures of six states had passed eight-

⁷ Iron Molders International Union Convention, Boston, 1867.

⁸ Quoted from a writer in the *American Workman* in John R. Commons and associates, *History of Labour in the United States*, Vol. II, p. 88. New York: The Macmillan Company, 1918.

hour laws by 1867, the statutes were poorly drawn and largely unenforced. The labor movement was later to attempt by strike what political activity failed to achieve.

Another reformer who associated himself with the trade-unionists was A. C. Cameron, editor of the *Workingman's Advocate*. He was a champion of money-reform and independent political action. Influenced by Edward Kellogg, the financial and social reformer, his variant of greenbackism was more than a polemic against the retirement of greenbacks at the close of the War Between the States. Currency-reform was a protest against the financier, a phase of other conditions in the American scene that urged independence for the small producer. The journeyman-craftsman could be interested in cheap money, as he resented and felt threatened by the technological, social, and market developments following the War Between the States. Monetary reform would make him a self-employed producer.

Delegates, representing local unions, trade assemblies or groups of local unions, eight-hour leagues, workingmen's assemblies, and international unions, formed the National Labor Congress (Union) which was first convened with 77 delegates in Baltimore in 1866. The conventions which met yearly until 1872 also included representatives from farmers' groups, women's rights associations, antimonopoly and other reform leagues. The principal subjects of discussion at these meetings were eight-hour legislation in the earlier years, and greenbackism and money-reform in the later period. Attention was also devoted to land-reform, alien contract labor, and rights of Negroes. Some achievements of Sylvis, Trevellick, Fincher,⁹ and their associates in the National Labor Union are noteworthy. They demanded a Federal department of labor, established a permanent lobbying committee in Washington, and attempted to initiate an alliance with the European labor movement, in the form of the International Workingmen's Association. Congress was encouraged to pass a law limiting to eight the hours of work for Government employees; vigorous protest affirmed the interpretation that the eight-hour law was to involve no reduction in daily wages. But the National Labor Union could not reconcile the proposals of miscellaneous reformers with their settled programs and the growing number of trade-unionists whose ideas and problems were in a state of flux.

When confronted in periods of depression by unemployment and threatened wage reductions, wage earners in small-scale industries have persistently tended to propose organization of producers' co-operatives. The foundations of trade-union philosophy with emphasis upon im-

⁹ Richard F. Trevellick was president of the International Union of Ship Carpenters and Caulkers; he was also elected president of the National Labor Union after Sylvis' sudden death in 1869. Jonathan C. Fincher was president of the Machinists' and Blacksmiths' International Union.

proved wages and conditions came to be questioned; the principal objective of the labor movement was transformed into a program for escaping from the wage system. The molders, for example, were so impressed with co-operation that in 1868 they changed their name for a period to "Iron Molders' International Co-operative and Protective Union." Sylvis' report to the 1868 convention has been widely quoted: "Combination as we have been using or applying it, makes war upon the effects, leaving the cause undisturbed. . . . The cause of all these evils is the WAGES SYSTEM. . . . We must adopt a system which will divide the profits of labor among those who produce them."

Whenever producers' co-operatives have become financially successful, however, their management has frequently tended to become a capitalistic enterprise. Less successful ventures, in contrast, have frequently resulted in longer hours of work and reductions in the union scales, to the detriment of conditions in other union shops. Co-operatives frequently developed out of unsuccessful strikes. To men out of work and not infrequently blacklisted, a co-operative enterprise appeared ideal. The shoeworkers' union was among those most interested in co-operatives, the grand scribe of the Order contending, in 1869, that, "the present demand of the Crispin is steady employment and fair wages, but his future is self-employment." Most unions in the decade after the War Between the States undertook similar experiments; particular mention can be made of the cigarmakers, bakers, nailers, tailors, printers, machinists, hatters, glass blowers, and even the coal miners. But workmen with limited resources and knowledge of markets could hardly be expected to compete successfully in the era of rising industrialism. The co-operative may be viewed as a combination of the desire to return to agrarian democracy and the effort to adjust to the changing class relationships of the emerging industrialism. Although the amalgam was seldom successful, the co-operative of producing classes persisted in the American labor movement, greatly reduced in importance in the period after the collapse of the Knights of Labor.

The Knights and the American Federation of Labor

Although the National Labor Union had evaporated by 1872, the idea of some sort of national organization was firmly implanted, but the precise form and objectives of the institution were still to be a subject of debate and experiment. The prolonged depression of 1873-1879 saw the disintegration of many national unions and the weakening or disappearance of many locals. Unemployment and the lack of funds combined to destroy them with the onslaught of employers by the blacklist, lock-out, and refusal to deal with unions. Partly as a consequence, the labor movement tended to become more or less secret societies, "with the impenetrable veil of ritual, sign, grip, and password."

The depression period was an era of reflection, debate, and short-lived experiments. Among the most significant issues raised were the following: (a) Should locals be supported and disciplined by a national organization of similar locals or should a single large body supervise locals of all types? The Knights were to favor the latter alternative. (b) In national unions of similar locals, what degree of control and centralization should reside with the national office? (c) What part should the labor movement play in reform and in politics? Should producers' co-operatives be encouraged? What relations should be established with agrarian movements? Wage earners were clearly not of one mind on these issues.

Three main groups emerged, distinguished according to their ideas regarding the form and objectives of a national labor association.¹⁰ The national unions composed of the most strategically located wage earners in the evolving market and technological scene, such as the printers, molders, building-trades workers, puddlers and rollers in the growing steel industry, favored a national organization to support strikes and to solicit legislation directly affecting wage earners. Another group of workers were enthralled with broad schemes of social reform such as currency legislation, antimonopoly proposals, land reform, and producers' co-operatives. A third group, "largely composed of immigrant workers imbued with the ideas of the First International, aimed to establish a national labor association on a socialist basis."¹¹

Successive wage reductions, waves of bitter and unsuccessful strikes, unemployment, and employer opposition accompanying the depression tended to emphasize the necessity for united labor organization. The first use of Federal troops in the railroad strikes of 1877 reinforced this attitude. The leadership of the American labor movement during the next generation received its baptism of fire in these unhappy days; its mode of thinking was profoundly influenced by the half dozen abortive national associations and the disastrous strikes of the period. Two principal organizations emerged to dominate the labor scene for the next several decades: the Noble Order of the Knights of Labor and the Federation of Organized Trades and Labor Unions of the United States of America and Canada (reorganized into the American Federation of Labor in 1886).

Organized in 1869 by Uriah Stephens, a Philadelphia garment cutter, the Knights remained a secret organization until 1882. By 1878 it had become established as a central national organization. Local bodies, called assemblies, admitted to membership "all who toiled"; the scavenger was admitted on exactly the same terms of equality as the most

¹⁰ This grouping has been suggested by Lewis L. Lorwin. See his *The American Federation of Labor*, pp. 8-9. Washington, D. C.: The Brookings Institution, 1933.

¹¹ Lewis L. Lorwin, *The American Federation of Labor*, p. 9.

highly paid or most skilled artisan. Only bankers, lawyers, professional gamblers, stockbrokers, and liquor dealers were excluded. The Knights are estimated to have numbered around 20,000 in 1879, 50,000 in 1883, 100,000 in 1885, 700,000 in 1886, and only 200,000 in 1890. Membership fluctuated in great degree; in the single year 1883, for instance, more than one-half of the group left the organization. The Knights did very little actual organizing work. They gathered together "the various unattached local unions that had sprung into existence, and helped to resuscitate local unions that had been abandoned by their own national trade unions."¹²

The Knights served to fulfill the great need for unity, for nominal support, and for affiliation on the part of locals. The assemblies and district assemblies of the Knights were highly flexible and were used for separate linguistic groups among new immigrants; district assemblies united members of a trade in a large metropolitan area; even a national union could be organized as an assembly (Window Glass Workers formed Local Assembly 300). Thus in some localities and industries the workers found it advantageous to organize their locals by shops, in others by departments, and in still others by industries. This system of organization offered special advantages to small groups of workers; some crafts or industries were too small to support an international organization. Furthermore, the district assembly could unite a great many diverse small groups in a single locality. The American Federation of Labor later had to resort to the federal labor local to meet somewhat analogous problems.

The Knights were the heirs in the eighties to the reformist ideas of Sylvis and Cameron in the sixties. The Order stood for trade-union demands such as the eight-hour day, health and safety laws, a mechanics' lien law, and the substitution of arbitration for strikes when the parties could meet on "equitable grounds." Significantly, the demand for apprenticeship laws was not included in the preamble to its constitution; the omission reflected the influence of the less skilled in the growing industrial development. The great slogan of the Knights was: "An injury to one is the concern of all." But they were more than a merely defensive or protective organization; they advocated producer co-operation, monetary reform as a means of securing producer independence, land reform, and antimonopoly legislation.¹³ Thus the Knights have been generally regarded as the last important manifestation of middle-class reform in the American labor movement.

¹² Commons and Associates, *History of Labour in the United States*, Vol. II, p. 344. New York: The Macmillan Company, 1918.

¹³ The protest against monopoly and the interest in money reform must not be interpreted as a concern with the technical operation of the money and commodity markets. The developments in industry and technology threatened the desideratum in which "every man was his own master—every man his own employer."

The meteoric rise of the Knights sprang approximately from the spectacular success of the railroad strikes against the Gould railways in 1885. "A man stronger than the Government itself" not only met with the Knights but also agreed that difficulties should be arbitrated. The Knights were further built up by exaggerated press stories of their size and power. Men who had been unemployed in the depression of 1883-1885 and who still remembered 1873-1879, wage earners who had suffered from blacklists and lockouts, and individuals bewildered by the new city life and new machinery found in the Knights of Labor a new champion. The success of the Knights was as electrifying as the agreement between the U. S. Steel Corporation and the Steel Workers Organizing Committee some 50 years later (1937).

Meantime, after recovery from the depressed conditions of the late seventies, the national trade-unions again were concerned with federation. The Federation of Organized Trades and Labor Unions convened in 1881 under the inspiration of a group of national trade-union leaders, disaffected groups from assemblies of the Knights, and socialists. The organization was to be oriented toward a discussion of trade affairs, "a systematic agitation to propagate trade-union principles," and particularly toward labor legislation explicitly patterned on the model of the English trade-unions. The term "Labor Unions" was inserted in the title on the insistence of the delegates from assemblies of the Knights, supported by the Typographical Union.

The Federation languished despite a favorable start. The separate national unions were really not greatly interested in legislation and could not expect to be successful at lobbying when the Federation represented only a small fraction (less than 25%) of organized wage earners. The Federation's budgets of \$400 to \$725 would not permit an elaborate program. The difficulties of welding together a group of national unions is illustrated by the withdrawal of the strong Amalgamated Association of Iron and Steel Workers because of the Federation's attitude toward the tariff. The key people were Richard Powers of the Lake Seamen's Union, P. J. McGuire from the St. Louis Trades and Labor Assembly (also Carpenters and Joiners), Samuel Gompers of the Cigarmakers, and Frank Foster of the Typographical Union. If the ideology, inspiration, and slogans of the Knights of Labor were middle-class-reformist and producer-co-operative, those of the new Federation were socialist. The preamble to the constitution of the Federation started out: "Whereas, a struggle is going on in all the nations of the civilized world between the oppressors and the oppressed of all countries, a struggle between the capitalist and the laborers, which grows in intensity from year to year . . ." These words still start the preamble to the American Federation of Labor constitution.

The movement for an eight-hour day was an unintended factor behind

the tremendous expansion of the Knights in 1886. Without the enthusiastic backing of many of the national unions, the Federation proposed that eight hours constitute a working day after May 1, 1886. The demand was to be enforced by strikes if necessary. The small Federation attempted without success to enlist the support of the national organization of the Knights for a general eight-hour day after May 1, 1886. T. V. Powderly, grand master workman from 1879 to 1893, was overwhelmed with the rate of expansion of the Knights: "So fast did the organizers send in applications for charters for local assemblies that I was called on by the General Secretary . . . to suspend organizing for thirty days." The office staff was not large enough to handle the mail! But Powderly did not accept the eight-hour day as a panacea; he felt that insufficient education and financial preparation had been achieved. Moreover, relations with several of the national trade-unions were none too cordial at the time.

Powderly was the kind of a man "English novelists take for their poets, gondola scullers, philosophers and heroes crossed in love."¹⁴ He had joined the Machinists' and Blacksmiths' National Union in 1870 at the age of 21. Four years later he was made a member of the Knights and rose with the organization to replace Uriah Stephens as grand master workman in 1879. He is regarded as an advocate of "escape from the wage system" through co-operation, in contrast to the wage-conscious trade-union leaders of the new Federation. Alarmed over the growing sentiment for strikes for the eight-hour day, which really served as a slogan to induce more fundamental unrest, Powderly issued a secret circular advising assemblies that the Knights could not support such strikes financially or otherwise. He protested with cause that an increasing number of strikers were not members of the Knights; actually men walked out of their jobs and then affiliated with the Knights because of the organization's prestige and popular appeal.

The first of May 1886 found over 300,000 wage earners out on strike for the eight-hour day or for shorter hours. Local assemblies of the Knights supported the strike, but Powderly's circular put the Order in an unfavorable light before the working class, particularly in later years when the national unions could point to the failure of the Knights to support their cause. Despite Powderly's disavowal of the strikes, the Knights were held responsible in the public mind for the Chicago Haymarket riot (May 3 and 4) in which over two hundred policemen and workmen were killed or wounded.¹⁵

¹⁴ John Swinton's *Paper*, October 17, 1886, quoted in *The Path I Trod, The Autobiography of Terence V. Powderly*, edited by Harry J. Carman, Henry David, and Paul N. Guthrie, pp. viii-ix. New York: Columbia University Press, 1940.

¹⁵ There is no necessity to describe in detail the period of police terror, the hysteria of the press, the role of anarchists, or the "trials."

The Knights had not been built up by careful organizing campaigns; conditions had been ripe for labor unions and men flocked to the Knights as a symbol. But the reputation of the Order faded with the Haymarket affair, ineffectual leadership, lack of substantial resources, inability to develop a disciplined organization of continuing membership, and organized opposition of employers it had frightened into existence. The Knights were to decline not so much because of the opposition of the Federation as because of the disappearance of the favorable conditions that had produced the mushroom growth.

Friction had developed between the Knights and the Federation despite their sharing of many common members and a widespread feeling for an amicable solution of any differences. The Knights were not always willing to let national unions or similar locals in an assembly manage their affairs. The climax of numerous incidents developed in the relations with the International Cigarmakers' Union when the Knights admitted a rival union (Progressive Cigarmakers' Union) and expelled all members of the "established" national union. The cigarmakers under Samuel Gompers and Adolph Strasser took the initiative in fomenting a fear that the national unions would be swallowed up by the Knights. Despite prolonged attempts to negotiate a "treaty," the American Federation of Labor was formed in the fall of 1886 from the old Federation. Beyond legislative interests, the new organization was to be concerned with building strong national unions by giving assistance in boycotts and during strikes or lockouts. The new constitution was a compact among autonomous national unions; as a consequence of friction with the Knights, the A. F. of L. was pledged to the "strict recognition of the autonomy of each trade." Samuel Gompers was elected first president and remained the union's "administrative personality" until his death in 1924, except for a single year, 1894-1895.

Market and Technological Framework

In order to understand the development of the American Federation of Labor, it is necessary to grasp the importance of both the rapidly changing market and technological framework, and the central constitutional ideas of the Federation.

(1) Among the most fundamental changes since the War Between the States has been the altered position of the household as a production unit. The proportion of all economic activity flowing through markets has increased spectacularly. This rise is attested by the growth of cities and the decline in the relative importance of the food-raising household. Before the War Between the States approximately half the country's working force was engaged in agricultural pursuits; the proportion was a little more than a third in 1900 and less than a fifth in 1940. The emergence of ready-to-wear clothing and restaurant meals is a part of

the same development. Labor conditions in the clothing industries were revolutionized by the sewing machine, which transferred production from home to factory. The War Between the States with its orders for uniforms and the discovery of standard measurements gave a great impetus to this evolution. The contraction of productive services in the household meant that market developments have had a wider repercussion on the material welfare of the community.

(2) Profound changes in technology and industrial organization have impinged on wage earners in many ways. Transportation and communication developments of the late nineteenth century altered the area of market competition. On the labor movement the impact of these changes revealed themselves quite early; the first national unions were partly a response to the dangers of competition among widely scattered localities. The size and resources of enterprises increased spectacularly, because of the economies of large-scale production, the advantages of research and national advertising, and monopolistic consolidations. The bargaining power of these combined firms in the labor market (that is, their ability to influence wage rates) was enhanced both directly by reason of size and consolidation and by virtue of political and community influence affecting the labor bargain. Moreover, the course of technological developments tended to magnify certain insecurities of wage earners. The hardships caused by accidents resulting from speed and mechanization were particularly acute before the enactment of workman's compensation laws, while the pace of machinery sometimes adversely affected the status of older workers. Numerous innovations in methods of production have frequently nullified the value of acquired skills and training, and one of the major problems of labor unions has been to diffuse the social costs of new methods of production. Insecurity of employment in the modern industrialized community, with periodic depressions, has not only made livelihood precarious but has engendered the psychological adaptations to instability.

A widely held opinion contends that mechanization necessarily reduces the average level of skill in a working force. This conclusion is not well founded, for although many skilled workers have been displaced, mass production techniques require new types of skills to plan, produce, install, and maintain complicated apparatus. Although the meaning of skill is not unequivocal, there is no evidence that the proportion of skilled labor in the working force has declined over the past 80 years. The linotype operator is not less skilled than the hand typesetter, nor the garment cutter than the harassed housewife. True, the technique of the craftsman has frequently been split up. Some operations require less skill and others more skill. Furthermore, the impact of innovation must be appraised in terms of the gross amount of personal insecurity and movement rather than simply in terms of net displacement. Thus

the lives of many thousand workers may be affected by new technology, although the net change in employment may be quite small.

(3) The status of wage earners in the American community has been significantly influenced by the expansion of gainful employment. A decline in the rate of increase is evident in the percentage increases by decades:

1870-80.....	39.1%	1910-20.....	9.0%
1890-1900.....	27.9	1930-40.....	7.1

Chances of promotion, regardless of how they may be appraised by the worker, have come to depend much more on retirement or advancement of superiors than upon an expansion in the total number of jobs. This fact has promoted the labor movement, for the susceptibility of wage earners to union organization is much greater among those reconciled to remaining in their current occupational status than among workers momentarily expecting to rise above their fellows.

(4) The very composition of the labor force has been drastically altered by the numbers and nationality of immigrants. Immigration proceeded in three major waves: the sixties and early seventies brought a first wave, the eighties the next, and the pre-war years of the twentieth century, when the peak movement was achieved, a third. English, German, and Scandinavian groups predominated before 1880; subsequent to that date they were progressively replaced by immigrants from Southern and Eastern Europe. The diversified influx of new workers brought a supply of skilled labor and a stream of unskilled workers for the expanding coal mine, steel, and garment industries. Immigrant workers brought with them ideas about labor organization and political programs. The diversified nationalities served also as a source of internal frictions and divisions among wage earners that were turned by employers to their advantage, particularly during periods of strikes.

(5) Few periods have produced as rapid an improvement in the standard of living of wage earners as the closing years of the nineteenth century. The real income of each gainfully employed member of the population increased 8%, 11%, and 19% respectively in the last three decades of the nineteenth century. Only the decade of the twenties has shown a similar substantial increase in the present century. Total real national income increased 3.2 times in the last 30 years of the nineteenth century, but hardly doubled in the next 30 years. The average money-wages of manufacturing, mining, and transportation employees increased from 19 cents to 67 cents per hour between 1870 and 1940. The purchasing power of these earnings increased until 1898 and then remained relatively constant until the end of the First World War, when the trend resumed its upward course at a rapid pace. Although these improvements are ordinarily thought to have lessened the

interest of wage earners in organization, the possibility of increases has provided an argument for organization and conditioned the direction of trade-union activity.

These gains have apparently not been made at the expense of property income, which has constituted approximately 20% of the total over the whole period. Wages and salaries have risen from 50% to 65% of total income, but this development is the consequence of the declining importance of agriculture, in which the return to household farmers is counted as "entrepreneurial income" rather than wages and salaries.

The Principle of Exclusive Jurisdiction

National unions in the American Federation of Labor have tended to organize the most strategically placed workers. This policy requires a definition of both the union's boundary line and authority within its prescribed jurisdiction. The conflict between the Federation and the Knights made a jurisdictional fetish a distinctive feature of the American labor movement. The "principle of exclusive jurisdiction"¹⁶ requires that the lines of demarcation between organizations be drawn clearly, that authority must be decisive to prevent other groups from obtaining a different bargaining unit with possible adverse effects upon the wages and working conditions of those in the "splinter" (narrow) group, that the Federation alone have the power to grant charters as evidence of jurisdiction, and that the union should control wage earners regardless of whether they had been organized. Many unions secured jurisdiction over groups they did not organize, did not even intend to organize, and so precluded other unions from the industrial territory. Charters were looked upon as evidence of a kind of proprietary right.

The principle of exclusive jurisdiction, involving the above-mentioned powers, is apt to prove particularly contentious when combined with the idea of sovereignty and autonomy of the separate national unions: "Inherently an international union is sovereign unto itself," Gompers said, "and our Federation can rightfully exercise only such functions as are delegated to it by the component parts which have instituted it and which constitute its makeup." Although the Federation alone could issue charters and define boundary lines, autonomy encouraged strong national unions to press the central body for "legal sanction" or justified defiance of an adverse decision. The conflict between sheet metal workers and carpenters over the introduction of a material known as metal trim is enlightening. The carpenters, who were organized into a

¹⁶ Article IX, Section 11 of the constitution reads: "No charter shall be granted by the American Federation of Labor to any National, International, Trade, or Federal Labor Union without a positive and clear definition of the trade jurisdiction claimed by the applicant, and the charter shall not be granted if the jurisdiction claimed is a trespass on the jurisdiction of existing affiliated unions, without the written consent of such unions. . . ."

strong and influential union compared to that of their rivals, claimed the material replaced wood. Despite adverse rulings in 1909 and 1921, the carpenters continued to exercise their control over this branch of the work; they secured "legal recognition" of their claims in 1926. The carpenters' union was able to maintain control over this material because it could afford to fight the entire building-trades labor movement.

The principle of exclusive jurisdiction is not to be confused with craft organization. The latter insists upon particularly narrow lines of demarcation while the former concerns itself with the sanctity of lines once determined by the charter. Lines of jurisdiction among unions can be drawn according to a number of different principles: the type of skill or training required, the materials used, the corresponding employer unit, or the tools and machines utilized. The American Federation of Labor has used all these as bases for determining jurisdiction. Unions with narrow jurisdictions are apt to be particularly sensitive to demarcation problems. Technical changes in new materials, machinery, or methods of distribution could easily endanger the future of such a union as a separate organization.

The fight within the Federation, out of which the CIO (1934-1938) developed, was a constitutional struggle over the principle of exclusive jurisdiction. Organization in the mass-production industries was retarded by the insistence of existing unions on their exclusive rights to workers in the unorganized areas, even though no attempt had been made to organize them. Since the A. F. of L. claimed the exclusive right to demark union boundary lines, a conflict in principle was to arise from the formation of the National Labor Relations Board and its power to decide whether "the unit appropriate for the purposes of collective bargaining shall be the employer unit, craft unit, plant unit, or subdivision thereof." The split within the labor movement focused attention upon the fundamental idea of organization of the American Federation of Labor.

The American Federation of Labor for Fifty Years

The reorganized Federation did not have smooth sailing during its first ten years. The new organization was not well known even among wage earners; negotiations for unity with the Order were continued until 1894 despite Gompers' conviction that "talk of harmony with the Knights of Labor is bosh." The Federation insisted that there be only one jurisdiction in each trade and that the Order revoke conflicting charters. National unions did not always pay their per capita dues, and Gompers' original salary of \$1,000 was not always forthcoming. The labor movement declined in membership from around 1,000,000 in 1886 to less than 500,000 in 1897 as a consequence of the collapse of the Knights and the

impact of the depression after 1893. In order to make a showing the Federation revived the strike for the eight-hour day, intending to strike different industries in successive years. The carpenters were fairly successful in 1890 but the miners did not make headway in 1891, and the tactics were discarded.

Among the most difficult issues confronting the Federation was an internal one involving conflicts between socialists and business-unionists. In a mood of self-criticism of the methods used by the Federation, the 1893 convention submitted to the affiliated unions a political program. Its 11 planks demanded: "compulsory education; the initiative (of legislation by petition); a legal eight-hour work-day; governmental inspection of mines and workshops; abolition of the sweating system; employers' liability laws; abolition of the contract system upon public work; municipal ownership of electric light, gas, street railway, and water systems; the nationalization of telegraphs, telephones, railroads, and mines; the collective ownership by the people of all means of production and distribution; and the referendum upon all legislation." Controversy centered about plank 10, "the collective ownership by the people of all means of production and distribution." Owing to parliamentary confusion the whole program was voted down in 1894. The socialists switched their votes to McBride of the miners, who was elected president. The following year Gompers was returned to office and the convention voted to regard the "platform" as the legislative demands of the Federation.

There were other difficulties. The powerful Amalgamated Association of Iron and Steel Workers¹⁷ was decisively defeated in its Homestead strike (1892) against the Carnegie Steel Company. The union had not fully appreciated the dynamic developments within the steel industry nor the rising power of the companies. Union leaders had been trained in the iron mills, and did not see the importance of steel making and continuous operations. The company was determined to crush the union. The railroad strikes of 1893-1894 revealed that employers had secured a powerful ally in the courts: the application of injunctions to labor disputes.

Perhaps the most enduring element in these early developments was the growth of trade-union agreements. The iron and steel workers had agreements from 1866 on, but the national agreement in the stove foundry industry (1891) served as a model. Other unions with agreements included the Bricklayers' and the three glass unions. "Without the trade agreement the labour movement could hardly come to eschew 'panaceas' and to reconstitute itself upon the basis of opportunism. The

¹⁷ The union reaffiliated with the Federation in 1887, having withdrawn in 1882 in protest against the position on tariffs of the Federation of Organized Trades and Labor Unions.

coming in of the trade agreement . . . was also the chief factor in stabilising the movement against industrial depressions."¹⁸

By 1897 the American Federation of Labor had attained its main characteristics, drawn from the experience of national labor unions in the preceding 30 years. The technique of individual unions involved high dues, a system of benefits, the cautious use of the strike and boycott, and trade agreements providing for voluntary arbitration. The unions were built upon the foundation of a jurisdiction. The philosophy of the producer co-operative had been discredited; the wage earner was permanently separated from the middle class. The operation of business-unionism was set within the context of certain "ultimate aims," expressed in legislative programs, that provided useful slogans and platforms. Political activity was to be restricted to the presentation of demands to existing parties and the support of friendly representatives.

During the 23 years following 1897 the membership of the American trade-unions expanded very rapidly in those fields in which they had made a start. Estimated membership increased from 447,000 in 1897 to over 2,000,000 in 1904; the next big spurt was from 3,000,000 to 5,000,000 between 1917 and 1920. Probably the only important groups outside the American Federation of Labor during this period were the railroad brotherhoods and the Industrial Workers of the World, launched in 1905 with a program of socialism, revolutionary tactics, and industrial unionism.

The I. W. W. appealed enormously to wage earners in the Western mines, migratory farm laborers and timber workers in the Northwest, immigrant textile workers, and seamen. The organization was able to win a great many strikes but unable to build an enduring organization. The character of the A. F. of L. is revealed by the kind of workers who flocked to the I. W. W. and in whom the Federation showed little interest. The wage earners in the I. W. W. were outside the main stream of the American community: single men or families excluded by migration, isolated community, or income level from the main values of the country.

When the United States entered the First World War, the need for peace in the ranks of labor led to the appointment of a series of public bodies and eventually to the War Labor Board, composed of 5 representatives of employers, 5 of trade-unions, and 2 of the public. The Board settled many specific issues (making 490 awards) and formulated a series of general principles that were to be affirmed by the National Industrial Recovery Act (1933) and the National Labor Relations Act (1935). The more important among these follow.

¹⁸ Commons and Associates, *History of Labour in the United States*, Vol. II, p. 520. New York: The Macmillan Company, 1918.

1. Recognition and affirmation of the right of workers to organize in trade unions and to bargain collectively, through chosen representatives. This right was not to be denied, abridged, or interfered with by the employers in any manner whatsoever.

2. Protection of workers against discharge for membership in trade-unions or for legitimate trade-union activities.

Although these principles did not achieve universal acceptance, they marked a great gain for trade-unionism.

But the American Federation of Labor suffered a series of setbacks. The joint attempt by 24 international unions to organize the steel industry (1919) was a miserable failure because of the lack of real resources, the separatist interests of the internationals, a vigorous Red scare in the press, the mobilized opposition of the steel industry, and the denial of civil liberties in many communities. The Steel Corporation refused to deal with unions "as such." Mr. Gary replied in the affirmative to Senator Borah's question: "... this matter all resolves itself then into the single issue, stripped of everything else, that your organization does not propose to deal with representatives of unions as representatives of unions for the reason that you conceive that that would destroy the principle of the open shop?" The chance to work out a systematic labor policy for the post-war period was smashed by the same issue in the Industrial Conference called by President Wilson in October 1919.

The depression of 1920-1921, the withdrawal of Governmental approval, and a vigorous "open shop" drive combined with the anti-Red agitation to reduce materially the strength of the trade-union movement. Membership dropped to 4,000,000 in 1922 and continued to decline to 3,000,000 in 1932. The period of the twenties was one of "union stagnation" and "welfare" programs on the part of management (pension plans, company unions, profit sharing, and personnel work). The open shop trend was helped by the migration of certain industries to the South and by the relative expansion of mass-production industries in which the American Federation of Labor had never established a stronghold.

The Rise of the Congress of Industrial Organizations

The depression of 1930-1933 had effects on unorganized workers analogous to those that attended the collapse of 1873 except that the appeal to escape the wages system through co-operatives was negligible. The new Government enacted legislation based on precedents in the policies of the War Labor Board and the Railway Labor Act of 1926, which had encouraged union organization. The A. F. of L. granted charters to Federal labor locals, increasing membership—outside international unions—over 300,000 between June and October 1933. John L. Lewis was equally successful in recouping the membership of the United Mine Workers. Total union membership is estimated to have jumped from

below 3,000,000 in early 1933 to 8,000,000 in 1938 and approximately 11,000,000 by 1942.

The 1934 convention of the A. F. of L. was confronted with the problem of devising a formula to take advantage of the opportunities for organization presented by the NRA.¹⁹ A vigorous campaign was demanded by some delegates who feared that the expansion of company unions, organized on company initiative particularly in mass-production industries, constituted a threat to the labor movement. That the enforcement of labor legislation demanded strong trade-unions was the contention of others. But how were workers in mass-production industries to be organized? Many existing unions claimed jurisdiction over various groups of employees in each plant and industry. Many delegates were convinced that only new organizing methods providing for industrial jurisdiction could be successful. Yet national unions did not intend to give up any jurisdiction.

After six long days of discussion a compromise resolution was adopted which recognized that in "many of the industries in which thousands of workers are employed a new condition exists requiring organization upon a different basis to be most effective." While authorizing industrial charters and organizing drives in automotive, cement, and aluminum industries, the convention also declared: "We consider it our duty to formulate policies which will fully protect the jurisdictional rights of all trade-unions organized upon craft lines and afford every opportunity for development and accession of those workers engaged upon work over which these organizations exercise jurisdiction." The compromise was only on the surface. As part of the same compromise the membership of the Executive Committee was expanded to include 15 vice-presidents to make the body more representative of the affiliated organizations.

The basic conflict over exclusive jurisdiction broke into the open in the 1935 convention at Atlantic City. John L. Lewis, Charles P. Howard, and David Dubinsky, leaders of the group concerned with organizing the mass-production industries, were disgusted with the way the Executive Committee had administered its mandate. Rather ineffectual campaigns had been conducted, in part because the central body of the A. F. of L. had never assumed responsibility for organization procedures. This had been the province of the national unions; the Executive Committee had neither staff nor techniques for effective organizing work. Furthermore, the Executive Committee had leaned over backwards in protecting jurisdiction in the issuance of new charters.

¹⁹ Section 7a of the NIRA provided in part:

"(1) That employees shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid and protection, . . ."

Mr. Lewis and his associates wished the convention to direct the Executive Committee to issue "unrestricted charters" to organizations formed in the newer industries, "regardless of claims based upon the question of jurisdiction." By a vote of 18,024 to 10,933 the convention rejected this view.

Several weeks after the adjournment of the 1935 convention, the founding of the Committee for Industrial Organization was announced. It was formed for "the purpose of encouraging and promoting the organization of the unorganized workers in mass-production and other industries upon an industrial basis." Organization was to be carried on ostensibly within the framework of the American Federation of Labor. The unions on the Committee were soon charged with invading jurisdictions, supporting a dual movement, and "fomenting insurrection" within the American Federation of Labor. They were ordered to appear for trial before the Executive Committee; suspension that followed was probably in violation of the constitution of the A. F. of L., which provided that a revocation of charter required a two-thirds majority vote by a regular convention. The unions were finally expelled in May 1937, and the CIO was organized as a separate federation the following year.

The unions originally affiliated with the CIO had a membership slightly below 1,000,000. The spectacular success of the CIO has lain in its organization of large enterprises long anti-union in sentiment. In March 1934, a high official of the General Motors Corporation asserted that his company would neither recognize unionism nor agree in advance to an election of bargaining representatives. Three years later both General Motors and Chrysler had signed agreements. The most significant single contract was that negotiated with the United States Steel Corporation, long regarded the citadel and symbol of anti-union policies. By 1941 the steel, automobile, electrical manufacturing, aluminum, and coal industries were largely organized. These developments must be placed in the context of a prolonged depression, a vigorous policy of supporting the right to organize instituted by the Federal Government in the National Labor Relations Act, and effective centralized leadership. The competition of the CIO forced the A. F. of L. to abandon rigorous adherence to the principle of exclusive jurisdiction, although the language and symbols remain "on the books."

The Changing Status in the Community

The picture that individuals carry within themselves as to their role in a community and the process of its operation can exercise a decisive influence on their behavior. This ideal element has consisted of "the self-sufficient individual in an economically self-sufficient neighborhood . . . freely competing with his neighbors in an economic order based on

free competitive acquisition. This ideal governed in the last century and was easily adapted to a pioneer, rural, agricultural society."²⁰ The impact of these beliefs is nowhere so clearly portrayed as in the position of labor before the courts.

Although the application of common law in this country never definitely precluded trade-unions, their objectives and activity were narrowly confined. This restriction followed from common-law standards of property and contract. The precepts evolved from practices of commercial transaction were applied to the labor market, and property ideas governing ownership of land and commerce were used in an era of large-scale manufacturing and urbanization. The contract was such a sacred instrument that when wage earners, in order to secure employment, signed a "yellow dog contract" agreeing not to join a union, a court order in the form of an injunction was granted to prevent an organizing drive and a breach of contract.²¹ The concept of property involved the unqualified right to hire and discharge for any reason and to have untrammelled access to the labor market. Peaceful picketing was so narrowly construed as to prevent effective strike action in many cases: "The name 'picket' indicated a militant purpose, inconsistent with peaceful persuasion. The crowds they drew made the passage of the employees to and from the place of work one of running the gauntlet. Persuasion or communication attempted in such a presence and under such conditions was anything but peaceable and lawful."²²

Formal and legal equality of treatment of the parties resulted in a *de facto* inequality because of the law's basic orientation toward property protection. The complaint of trade-unions against the legal order "has not been that laborers in such organizations and labor organizations were not treated as other litigant organizations were but that they were so treated."²³ Their disputes were considered ordinary controversies over trespass, breach of contract, and business relations.

The significance of basic beliefs in the law is well illustrated by judicial interpretation in several areas. The due process clause of the fourteenth amendment to the Constitution was transformed from its "earlier meaning of due procedure to a primary concern with the reasonableness of legislation involving not procedure but the substantive rights of property."²⁴ The conception that achieved this reversal would not allow minimum wage laws, most regulation of hours by Government, "peaceful picketing," nor limitation on the right of discharge. Justice

²⁰ Roscoe Pound, *Social Control Through Law*, p. 15. New Haven: Yale University Press, 1942.

²¹ *Hitchman Coal Co. vs. Mitchell*, 245 U. S. 229 (1917).

²² *American Steel Foundries v. Tri-City Central Trades Council*, 257 U. S. 184 (1921).

²³ Roscoe Pound, *Social Control Through Law*, pp. 78-79.

²⁴ Benjamin F. Wright, *The Growth of American Constitutional Law*, p. 172. Boston: Houghton Mifflin Company, 1942.

Holmes made explicit in his dissent in the *Lochner* case the importance of the basic premises of the majority: "This case is decided upon an economic theory which a part of the country does not entertain. . . . the Fourteenth Amendment does not enact Mr. Herbert Spencer's Social Statics." Meantime the Sherman Antitrust Act was passed in 1890 as a political protest against the rapidly rising economic and political influence of enterprises. Despite congressional action in the Clayton Act (1914), the same ideal element in the law regarded the refusal of the stonecutters' union to handle nonunion stone as an unreasonable restraint of trade:²⁵ "An act which lawfully might be done by one, may when done by many acting in concert take on the form of a conspiracy and become a public wrong . . ." Justice Brandeis' classic dissent points to the *de facto* inequality in the legal status of the journeymen stonecutters and the United States Steel Corporation and the United Shoe Machinery Company.

The concept behind the law was modified in some details in the period following the War Between the States. But the main outlines were not decisively altered until after the 1937 fight over the Supreme Court. Clearly a new ideal or set of beliefs underlies the recent judgments of the Supreme Court. Instead of regarding peaceful picketing as a contradiction in terms, the new interpretation holds the right to picket to be "within that liberty of communication which is secured to every person." Instead of looking upon any picketing with suspicion as an infringement of property rights, the current opinion views picketing fundamentally as an exercise of freedom of speech in the area of industrial relations. An enterprise may not discharge a wage earner for joining a union; the yellow dog contract is no longer grounds for an injunction to prevent organization. No contract may be made for wage rates below certain standards, nor for hours beyond specified limits save at overtime rates, at least in certain sectors of the economy. The injunction has been restricted in its applicability to labor disputes; substantive due process has been significantly altered. While all these alterations proceed from a view of society fundamentally different from that which underlay judicial opinion until 1937, the precise character of the new benefits has not been clearly formulated.

The position of wage earners and labor unions in the wider community is also reflected in the recruiting of union leadership. Business enterprise and formal education, particularly in professional schools, have been the more important avenues of vertical mobility in the American community. The dominant values that extolled money making and success were closely linked to these ladders. Because of the reluctance to accord high

²⁵ *Bedford Cut Stone Co. v. Journeymen Stone Cutters' Association*, 274 U. S. 37 (1927).

prestige to trade-union leadership a great deal of potential union leadership was drawn off into the more esteemed positions of business management. Much union leadership was crystallized by accidental factors that blocked more ordinary mobility. Powderly and Murray were blacklisted at an early age, as was Lewis' father; Hillman was interested in trade-unions before he came to this country; Gompers' family was active in union affairs abroad, and he too was blacklisted.

That organized labor now offers an important avenue of vertical mobility is testimony to its changed status in the community, to changing power relationships. As young men, James Carey, Julius Emspak, and Walter Reuther achieved positions of national prominence by virtue of their trade-union offices. The enhanced prestige of organized wage earners is indicated by representation in Governmental and public agencies: committees for minimum wage determination in industry, arbitration and mediation bodies, production committees, policy advisory boards, and numerous quasi-public, educational, and research organizations. The final achievement of legal recognition conferred by the Wagner Act is a part of a wider movement for community prestige and responsibility.

The total status of labor in the American community has thus altered materially over the period since the War Between the States in response to important changes in technology, market organization and conditions of competition, social relations within the community, and public beliefs, ideas, and values. The labor movement itself has played a significant role in influencing these factors.

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CHAPTER 27

Money and Banking Since 1860

The Greenbacks ¹

THE OUTBREAK OF THE WAR BETWEEN THE STATES in April, 1861, found the United States with a monetary structure consisting of standard gold coins, subsidiary silver and minor coins, and the note issues of some 1,600 state banks. Although, legally, the country was on the bimetallic standard, the mint ratio of 16 to 1 undervalued silver sufficiently to keep the full-weight silver dollar out of circulation.

The paper currency provided by the state banks was of all degrees of goodness. Some of it was accepted at par over a wide area, but a great deal of it was of such questionable value that it was subjected to a heavy discount when circulated at any considerable distance from the place of issue. Much of it was backed by the bonds of Southern or border states; and when the South seceded from the Union, the value of this security shrank seriously, with the result that banks failed by the wholesale and the volume of worthless currency outstanding decidedly increased.

President Lincoln had assigned the important post of Secretary of the Treasury to Salmon P. Chase, a former governor of Ohio, and United States senator from that state. Mr. Chase was a lawyer of ability, but had had no practical experience in finance. The administration had fallen heir to a bad fiscal situation. The large deficit and weak national credit which the new secretary found made his task all the more difficult.

Much criticism has been leveled at Secretary Chase for his policy of borrowing and of issuing paper money instead of inaugurating immediately a rigorous system of taxation. Granting that a war should be financed as much as possible by taxation, as little as possible by borrowing, and not at all by fiat paper money issues, the situation that confronted the Treasury during the first two years of the war must be considered before judgment is passed on it.

In the war's early stages the North, blindly confident that the "rebellion" could be put down in a few months, held out against the slow and unpopular device of taxation. Furthermore, the administration was

¹ For a comprehensive treatment, W. C. Mitchell, *A History of the Greenbacks* (Chicago: University of Chicago Press, 1903), and D. C. Barrett, *The Greenbacks and the Resumption of Specie Payments, 1862-1879* (Cambridge: Harvard University Press, 1931), are recommended.

far from having the full support of the people in its conduct of the war. The succession of stunning blows administered to the Union armies shook the faith of the people in the Government's ability to cope with its manifold difficulties, hence the popular support needed for the imposition of burdensome taxes was lacking. Later on, when the tide of battle turned and the superior resources of the North left little doubt of the ultimate outcome, a heavy increase in taxes was imposed without difficulty.

By the end of 1861 the financial situation had become so precarious that the banks of the country, with the exception of those in California, suspended specie payments, and soon after the Government followed suit. From that time until specie payments were resumed by the Treasury in 1879 the United States was on an irredeemable paper-money standard.

Congress meanwhile created a new form of paper money, known officially as the United States Note but popularly as the greenback. It was made full legal tender except for payment of customs duties and interest on the public debt. It was nominally redeemable in coin, but actually irredeemable until specie payments were resumed. Three issues totalling \$450,000,000 were authorized by Congress and \$431,000,000 actually placed in circulation by the Treasury in 1862 and 1863 in payment of Government expenses. Mr. Chase, opposed in principle to meeting the Treasury's obligations with these IOU's, yielded to the view of Congress that such a policy was justified by the Government's urgent need for something with which to pay its bills, as well as by the shortage of pocket money caused by the failure of numerous state banks of issue and the suspension of specie payments. The first two of the three issues of greenbacks were made convertible into bonds, but since relatively few persons took advantage of the privilege of conversion, some \$400,000,000 worth remained in circulation.

Because the Government was unable to redeem the greenbacks in coin, they promptly went to a discount in terms of gold, and, being the only legal tender money in circulation, they became the *de facto* standard of value until specie payments were resumed in 1879. It will be recalled that in 1853, in order to keep our small silver coins in circulation, a reduction had been made in their weight. They continued to circulate for a brief time after the suspension of specie payments, but soon the decline in the value of paper money in terms of specie caused them to go to a premium, and they gradually disappeared.

The disappearance of small coins created a serious hardship, since the smallest denomination of the first of the three issues of greenbacks was five dollars. Old foreign coins came into use, one-dollar bank notes were cut into halves or quarters and passed as change, municipalities and private individuals printed fractional paper money, and even postage stamps were accepted as money. These devices were so obviously un-

satisfactory that Congress authorized the issue, first, of special postage currency and, later, of fractional notes.

Shortly after the suspension of specie payments a gold exchange was established in New York adjacent to the stock exchange. Here business firms could obtain at the existing premium gold to pay duties on imports or to settle foreign obligations. They could also hedge against any changes in prices of goods due to fluctuations in the value of the greenback. Naturally, also, persons who had no legitimate need for trading in gold found the exchange an intriguing outlet for their gambling instincts. The daily quotations were regarded as the authoritative measure of the depreciation of our paper money in terms of gold.

Starting with a quotation of \$98 (98 per cent of the value of gold) in January, 1862, the value of greenbacks in terms of gold fluctuated upward or downward, principally with the fortunes of the war and the state of the national finances; but the general trend was downward until the summer of 1864, when a low of \$35 was reached. Although the general trend thereafter was upward, for years after the cessation of hostilities there was still a marked depreciation; in fact, only two weeks before the resumption of specie payments on January 1, 1879, the premium on gold disappeared entirely and the gold exchange went out of business.

The employment of the greenbacks produced the usual unfortunate economic effects that accompany the financing of a war by the creation of circulating credit instruments, whether they be bank notes and deposits or Government paper money. Inflation resulted, and with it a higher money cost of the war and a reduced standard of living for persons whose money incomes were stationary or failed to increase as rapidly as the cost of living rose. Wesley C. Mitchell² estimates that "rather more than a fifth of the whole amount (of the public debt) was due to the substitution of United States notes for metallic money."

The Greenbacks in the Post-War Period

As soon as the war was over, Secretary of the Treasury McCulloch, who succeeded Mr. Chase, urged that, since the issue of the greenbacks had been a war measure, the \$400,000,000 still outstanding be retired as quickly as possible. Congress seemed sympathetic with his general proposal, but feared the deflationary effect of the rapid contraction of so important a part of the nation's circulating media. In 1866 it authorized the Secretary to retire \$10,000,000 within six months and not to exceed \$4,000,000 per month thereafter. A downward trend in prices characteristic of post-war periods was setting in. Furthermore,

² W. C. Mitchell, *A History of the Greenbacks*, p. 419. Chicago: University of Chicago Press, 1903.

the settlers of the West were burdened with debt, and neither the agricultural nor the general business outlook was favorable. As a result, after the volume of greenbacks had been reduced to the extent of \$44,000,000, Congress called a halt to further contraction. The deficiency of revenue during the panic of 1873 caused a large part of the retired portion to be reissued, bringing the outstanding volume up to \$382,000,000. In the so-called Inflation Bill, Congress tried to restore the authorized limit to \$400,000,000, but President Grant intervened with a veto.

On January 14, 1875, Congress passed an act providing for the resumption of specie payments on January 1, 1879. In the measure was included a provision that greenbacks should be retired to the extent of 80 per cent of the amount of new national bank notes added to circulation, but that the process should cease when the total volume of greenbacks had fallen to \$300,000,000.

Meanwhile the question of currency contraction became a political issue. Beginning with the election of 1872, the "greenback movement" increased in strength until in the congressional elections of 1878 its candidates obtained more than a million votes. Not only did the Greenback party's own candidates poll a significant vote, but many Democratic candidates endorsed some of its proposals.

As a result of the addition of many anti-deflation-minded members, Congress ordered the contraction in the volume of greenbacks to cease at the amount then outstanding: \$346,681,000. This still remains the official authorized circulation. The last serious effort to make a political issue of the greenbacks was undertaken by the Populist party in the early 1890's. They proposed to supply a Government paper currency in sufficient amount to provide a per capita circulation of fifty dollars. In the dire economic conditions prevailing at that time, particularly in the newer agricultural areas, the appeal of such a program can be easily understood.

The Silver Question ³

The preceding discussion of the greenbacks has revealed how a form of money that was intended to be only a temporary instrument of war finance was seized upon by interests battling with deflation and thereby perpetuated as one of our forms of money. The silver dollar has likewise been employed for the same purpose, except that in its case the interests in question had the support of the producers of silver.

The bimetallic system inaugurated in 1791 was not formally abandoned until 1900, but the two precious metals had circulated side by side only at rare intervals. Silver dollars had disappeared from circulation long before the War Between the States, and, naturally, when the country

³ For an authoritative treatment of American experience to 1897, see J. L. Laughlin, *The History of Bimetallism in the United States*, 4th ed. (New York: D. Appleton-Century Company, 1897).

was operating on a greenback standard, there was no inducement to employ for domestic transactions dollars which were worth much more as metal than as money. The relatively few silver dollars coined by the mint during that period were employed in export trade. During the decade of the 1860's the production of silver in the United States had increased steadily, but the discount on paper money was still too great to cause the return of silver dollars to circulation.

In 1873, in view of its long absence from circulation, Congress dropped the silver dollar from the list of coins to be struck at the mint. This action was tantamount to placing the country on a gold standard as soon as specie payments would be resumed.⁴

During the decade of the 1870's a succession of events was responsible for a marked decline in the value of silver. In 1871, the new German Empire adopted the gold standard, and within the next few years it sold large quantities of old silver obtained from the former standard coins. In 1874 Sweden and Norway, and in 1875 Holland, followed Germany's example. In 1873-1874 the countries comprising the Latin Union⁵ suspended the free and unlimited coinage of silver and later (1878) ceased coining standard five-franc pieces altogether. At home, discoveries of rich bodies of silver ore in Nevada and other Western states were adding greatly to the domestic supply.

This decline in the market value of silver soon wiped out the premium which it had enjoyed over the legal tender notes. "Trade dollars," which, as their name indicates, had been coined solely for use in foreign trade, in spite of the fact that they were heavier than standard silver dollars began to appear in our domestic circulation, as did the subsidiary silver coins which had left the country. The same general group which backed the greenback movement of the 1870's joined with the people of the silver-producing states in demanding that the mint be reopened to the free coinage of silver at the ratio of 16 to 1. Had this been done, there would have been a great influx of that metal into the mint and a corresponding increase in the volume of money, since this ratio now overvalued silver. The "inflationists" were probably right in assuming that this increase would have a salutary effect upon the price deflation that they were trying to cure.

By 1876 the demand for the free coinage of silver had become so great as to be an important issue in the presidential election. Two years later the silver group had a majority in the House of Representatives and, while they failed to obtain the concurrence of the Senate in an outright free silver bill, they forced that body to agree to a compromise

⁴ This legislation attracted little attention at the time, but when later both general prices and the price of silver entered into a persistent decline, the silver group, contending Congress acted hastily and without being cognizant of the consequences, dubbed the proceeding "the Crime of '73."

⁵ France, Belgium, Switzerland, Italy, and Greece.

measure. This legislation, known as the Bland-Allison Act, required the Secretary of the Treasury to purchase and have coined into dollars not less than \$2,000,000 nor more than \$4,000,000 worth of silver bullion each month. Since the several men who held the office of Secretary during the life of this measure were conservatives, each of them bought the smallest amount that the law allowed; but, even at that, \$378,166,000 were coined and placed in circulation, mostly in the form of silver certificates, for only a limited section of the public was willing to carry silver dollars. The addition of this large amount of new money to the existing stock of greenbacks and bank notes placed a heavy strain upon the recently resumed gold standard, for, while the law did not specifically call for the redemption of silver dollars in gold, the gold standard could not be maintained unless all other forms of money were kept at a parity with the standard money.

Prices continued to decline and the clamor for more and cheaper money increased. The Populist party, which had become the champion of the greenback, also espoused the cause of free silver. By 1890 the silver forces in Congress were more powerful than ever. An outright free silver act could undoubtedly have passed both houses, but the certainty that President Harrison would veto such a measure resulted in the substitution of the Sherman Silver Purchase Act, which made more liberal concessions to the silver group than had been granted by the Bland-Allison Act. The Sherman Act provided that the Secretary of the Treasury should buy 4,500,000 ounces of silver bullion each month and issue in payment legal tender currency, which came to be known as "Treasury notes of 1890." During the three years that the act was in operation the Treasury bought some \$156,000,000 worth of bullion, which meant that that amount of new paper currency was placed in circulation.

Silver and the Panic of 1893

Soon after the passage of the Sherman Act, conditions in business and in Government finances took a turn for the worse. Congress had substituted a protective tariff for the revenue measure of the preceding administration, with the result that the Government's income was impaired, while an extravagant pension act made heavy new demands upon the Treasury's diminishing revenues. In 1892 an unfavorable balance of international payments caused a heavy shrinkage in the nation's gold reserve at a time when the monthly issue of the new treasury notes was making increasingly difficult the task of keeping all of our money at a parity with gold. Such serious doubt arose regarding the Treasury's ability to maintain gold redemption that a still more severe drain was made upon the existing stock while little new gold came in.

In 1882 Congress had indicated its desire that a gold reserve of \$100,-

000,000 be maintained for the purpose of redeeming greenbacks and thus keeping them at par. It had not, however, set this reserve apart from the ordinary funds of the Treasury, but had merely directed the Secretary of the Treasury not to issue any more gold certificates so long as the metallic gold on hand was less than \$100,000,000.

By April, 1893, the condition of the Treasury was such that the \$100,000,000 redemption fund could no longer be kept intact with the outgo for current expenses so persistently in excess of incoming receipts and with the marked tendency on the part of the public to demand gold for hoarding. In order to halt the increasing load placed upon a dwindling gold reserve by the monthly purchases of silver and the attendant note issue required by the Sherman Act, Congress repealed the purchase clause of the Act in October, 1893. This action, however, did not restore confidence, because of the rapidly deteriorating banking and general business situation. The gold reserve continued to shrink as the deficiency in our national revenues persisted. In 1894, in the face of a growing popular resentment against "Wall Street" and "big business," the Government, exercising the authority conferred by the Resumption Act of 1879 and with the aid of New York bankers, sold a series of bonds in order to obtain gold with which to redeem other forms of money, principally legal tenders, presented for that purpose. Because of the serious shortage of revenue it was necessary to pay redeemed notes out again immediately. Soon the same notes came back for redemption and the process was repeated over and over, coming to be known as "the endless chain."

This difficult situation came to an end with the return of confidence and the advent of better times in the late 1890's, but Congress had learned the lesson that if the gold standard was not to be subjected to dangerous strain whenever business fell into a slump, more adequate and definite precautions must be taken. Accordingly, in 1900, an act was passed which definitely established the gold standard and directed the Secretary of the Treasury to maintain all forms of money at a parity with gold. As for the legal tender notes, a separate division of redemption was set up in the Treasury and assigned a special gold reserve of \$150,000,000. Whenever notes were redeemed from this fund, they were not to be reissued except in exchange for gold. It was further prescribed that, should the fund ever fall below \$100,000,000, the Treasury must replenish it by the sale of bonds for gold. Congress had already (1898) ordered the Treasury to retire the "notes of 1890" and to coin the bullion bought with them into silver dollars.⁶

⁶ Since the money value of the silver dollar was considerably greater than the cost of the metal, 218,000,000 silver dollars could be obtained from the \$156,000,000 paid for the bullion. However, about \$20,000,000 worth of bullion was diverted to the coinage of smaller silver pieces.

The Campaign of 1896

Reference has already been made to the strength of the sentiment favoring a return to bimetallism at the time the Sherman Act was passed in 1890. The panic of 1893 and the prolonged hard times which followed, with their inevitable accompaniment of low prices for agricultural products and widespread unemployment in cities, created profound political repercussions. In the hotly contested campaign of 1896, the Republicans attributed the country's difficulties chiefly to the low tariff policy of the Cleveland administration. They did, however, in spite of rather serious defections from their ranks, commit themselves to the maintenance of the gold standard unless or until bimetallism should be established on a world-wide basis through an international agreement. The silver group had captured the Democratic national convention. Under the brilliant leadership of their candidate, William J. Bryan, they promised relief to debtors and recipients of starvation prices through the restoration of free and unlimited coinage of silver at a ratio of 16 to 1.

In the November election of 1896, Mr. Bryan carried the Solid South and the newer agricultural states of the West, but the "full dinner pail" appeal of the Republicans, coupled with their plea for "sound money," won them the election.

A somewhat feeble effort was made by the victorious Republican administration to bring about bimetallism by international agreement, but the fact that Great Britain turned a deaf ear was sufficient in itself to cause the proposal to be dropped. By the passage of the Act of 1900, Congress then proceeded, as has been noted above, to place the country definitely on the gold standard.

Mr. Bryan's remedy for the restoration of prices, the free coinage of silver at 16 to 1, would, if adopted, undoubtedly have been a potent influence in reversing the downward trend of prices that had persisted since the end of the War Between the States and had ended in the debacle accompanying the great depression of the 1890's. Particularly was this likely to have been the case since the ratio of 16 to 1 assigned a value to silver which at the time was twice as great as its market value. Had the Bryan proposal been adopted, while the market value of silver would have been enhanced by large-scale coinage, the mint would have been flooded with silver, domestic and foreign, gold would have left the country or been hoarded, and the United States would have found itself alone on a silver basis while most of the rest of the world transacted business in terms of gold.

The Gold Inflation

Mr. Bryan frequently accused the Republican party of taking the credit for even the acts of God. Events following the election of 1896

seemed partially at least to bear out that contention. Not only was one rich discovery of gold after another made, but the perfection of the cyanide and chlorine processes made it profitable to extract metal from much lower-grade ores. Thus, instead of relief from low prices coming from silver, gold brought about the reversal in the trend. Although the Democrats renominated Mr. Bryan in 1900, and again included a silver plank in their platform, conditions had so improved that there was relatively little vote appeal left in the subject, and it soon disappeared as a political issue.

Meanwhile, the regime of rising prices that had set in continued at a moderate but somewhat disturbing pace until the entry of the United States into the First World War, when it developed into an inflation of large proportions culminating in the crisis of 1920.

The gold standard became thoroughly entrenched during the years of the twentieth century preceding the First World War. It had the great advantage of internationality but was revealing a lack of constancy in value, and the ease with which it was overthrown when the First World War broke out revealed a serious lack of ability to maintain itself in critical situations. Even the United States, with its large gold stock, found it necessary in 1917 to place an embargo upon the export of gold and to restrict the conversion of other forms of money into gold. After the war, growing interest was aroused in possible substitutes for a gold monometallic system. In spite of the increasingly critical attitude toward the gold standard, the leading countries readopted it during the 1920's, only to leave it again in the turbulent 1930's.

Résumé of the Battle Against Deflation

A downward trend in the general price level is the natural aftermath of a war-induced inflation. In the period of the War Between the States, this reaction was accentuated by the rapid expansion of agriculture and industry after the war. A corresponding increase in the volume of money should have been forthcoming, but a defective system of currency and banking stood in the way. The National Banking Act, passed in 1863, had sacrificed elasticity to safety.⁷ Not only had the volume of greenbacks been frozen by law but, from the time of their first issue, they had been regarded as a temporary form of money that would be withdrawn as soon as possible. Gold and silver were out of circulation until the respective premiums that they enjoyed over greenbacks had disappeared. However, at the very time when silver coins were beginning to reappear in circulation, Congress had closed the mint to the free coinage of that metal. As things stood, therefore, none of these forms of money could be relied upon to provide, automatically, the additions to the volume of circulating medium that were required.

⁷ This point will receive fuller consideration in the sections that follow.

Farmers and other small producers, especially those heavily encumbered by debt, were easily persuaded by their representatives in the political arena not only to resist the further retirement of the greenbacks but to clamor for extensive new issues. The greenbacks were neither a sound device for raising revenue nor a desirable type of currency, but the program of retirement inaugurated in the late 1860's did tend to accentuate a pronounced deflationary trend. Hence opposition to it had a sound basis. While the long-drawn-out battle for the remonetization of silver had its inception in the demand of silver producers for a higher price for their product, it was but natural for the victims of a falling price level to join forces with them. Here again, while the objective was worthy, the remedy was highly questionable, for the opening of the mint to silver would have placed the United States, alone of the important nations, on a silver basis when world business was being transacted in terms of gold.

A far better remedy, though by no means wholly efficacious in the stabilization of the price level, lay in the establishment of a central banking organization. It would at least have provided adequate supplies of money and credit. This remedy, however, was not made available until the passage of the Federal Reserve Act in 1913. As will be seen later, even this device has not been effective in checking violent price upheavals.

The National Banking System

At the outbreak of the War Between the States, the banking facilities of the country were largely in the hands of some 1,600 state banks, the exceptions being private unincorporated firms and individuals. Since the use of checks had not yet been extensively developed, especially in small communities and in agricultural areas, the issue of notes was still an important part of a bank's activities. Abuse of this privilege had led to the imposition of various systems of regulation, the favorite being the so-called free (or stock) banking system inaugurated in New York in 1838 and subsequently copied by fourteen other states. Its essential feature was the deposit of bonds as security for note issues. The currency provided by such a system varied in goodness according to the quality of the bonds employed as collateral. As has been noted, secession and the war had seriously impaired the value of much of this security, and the consequent epidemic of bank failures had greatly reduced the volume of notes in circulation.⁸

Early in his administration as Secretary of the Treasury, Mr. Chase began to advocate the inauguration of a system of national banks based upon the New York free banking idea but using only the bonds of the

⁸ For an excellent discussion of the formative period of the National Banking System, see A. M. Davis, *The Origin of the National Banking System* (Washington, D. C.: Government Printing Office, 1910).

United States Government as security. He believed that the following benefits would be derived: (1) the country would be provided with a safe and a uniform currency as opposed to the hodgepodge of note issues of thirty-four states; (2) the absorption of bond issues by national banks would strengthen a weak public credit and afford a steady market for new issues; (3) the existence of a single nation-wide system of banking and currency would tend to unify the nation and help to obviate the extreme sectionalism that had led to the War Between the States; (4) national banks scattered through the length and breadth of the land would greatly facilitate the collection and disbursal of public funds, as well as the distribution of Government loans.

Congress was impressed by these objectives and increasingly irked by the undependable character of many state bank issues and the recent tendency of the state banks to inflate the currency and thus add to the financial muddle into which the country had been plunged. Accordingly, in 1863, it passed the National Banking Act, the chief features of which were: (1) that it created a system of unit banks chartered and supervised by the Federal Government; (2) that it provided a safe and uniform currency, backed not only by the general assets of the bank and the double liability of its stockholders but also by a deposit of United States bonds and by the Government's direct guaranty;⁹ (3) that it required a substantial reserve to be carried for the protection of depositors—a group that had been generally overlooked by state banking systems.

Shortcomings of the National Banking Act

While the National Banking Act was a distinct contribution to American banking, it left much to be desired. Note issues based upon Government bonds were fundamentally inelastic, especially when the issuing bank made it a practice to have outstanding at all times its full quota of notes. Even where a bank could legally issue more notes, the incentive to do so was not the fact that the community it served required more notes but that bonds could be bought at an attractive price and yield. This situation gave to these issues a perverse elasticity because bonds tended to rise in price during a period when times were good and more circulating media were needed, and to fall to a bargain level in hard times when less money was needed. The Treasury found itself with large surpluses in good times, and naturally applied these to the reduction of its outstanding obligations. In so doing it sent bond prices to a point where it was not profitable to employ bonds to back the additional currency that the state of prosperity required.

By failing to sanction the establishment of branches, the National

⁹ The greenbacks also had the backing of the Government and, in addition, were legal tender.

Banking Act fostered the creation of many small independent units with inadequate resources and indifferent management. It failed also to provide for the creation of a central institution whose principal job should be the mobilization of the surplus reserves of the banking system, the assumption of leadership in matters of credit policy, and the placing of emergency funds at the disposal of the other banks in the system. Instead, it set up a scheme of pyramided reserves in which a country bank could carry 60 per cent of its lawful reserve in the form of a deposit in a reserve city bank or in a central reserve city bank, and a reserve city bank could carry 50 per cent of its reserve in a central reserve city bank. The upshot of the matter was a heavy concentration of the nation's banking reserve in the banks of New York City. Since such funds were liable to withdrawal without notice, they were loaned, for the most part, on call to speculators in the stock market. If a panic occurred in the market, the New York banks were unable to respond to the widespread demands of the interior banks for the return of their funds.¹⁰

It had been expected that there would be wholesale conversion of state banks into national banks, and that the demand for Government bonds would be greatly increased. Neither of these things happened to the extent anticipated. In order to get the desired results, in 1865 Congress, by a close vote in both houses, placed a prohibitive tax of 10 per cent per annum upon the notes of state banks and thus conferred a note issue monopoly on the national banks. Since deposit banking was still in the early stages of its development, especially in rural communities, most banks extended credit in the form of bank notes. To be deprived of this privilege meant that a bank must either convert to the national system, lend its credit in the form of deposits, or go out of business. Hence there was a sudden decrease in the number of state banks and a corresponding increase in national banks.

Revival of State Banking ¹¹

As time went on, however, and the use of checks became more widespread, the number of state banks began to overtake that of the national banks and in time left it far behind. The explanation lay largely in certain competitive advantages that state institutions enjoyed and that were not conferred upon national banks until much later. State banks, as a rule, could lend on the security of real estate, and they could set up savings and trust departments. National banks could do none of these

¹⁰ For an authoritative treatment of this subject, see O. M. W. Sprague, *History of Crises Under the National Banking System* (Washington, D. C.: Government Printing Office, 1910).

¹¹ This period in the history of state banks is fully treated in G. C. Barnett, *State Banks and Trust Companies Since the Passage of the National Banking Act* (Washington, D. C.: Government Printing Office, 1911).

things. The minimum capital stock requirements were generally lower and a larger percentage of their capital could be loaned to one borrower. Furthermore, the reserve requirements were often much more lenient than those prescribed by Congress and a differentiation was made between demand and time deposits in computing the lawful reserve.

So much of the regulatory machinery of state banking prior to the War Between the States was concerned with the issue of notes that when this function ceased, there was little or none left. In many states during this transition period, a bank that had been deprived of the privilege of issuing notes was regarded as no different from any other business corporation and was as free from restrictions. As the number of state banks increased, after the initial setback in the late 1860's, the states set up systems of regulation which have improved over the years, especially as the bitter experiences of periodic orgies of bank failures have dictated such improvements. The banking codes and the strictness of their enforcement in many of the states compare favorably with the laws and machinery that control national banks. Some few still lag behind, but constant improvement is being made. Membership by many state banks in the Federal Reserve System and by the great majority of banks in the Federal Deposit Insurance Corporation has tended to place both state and national banks on a uniform basis.

The Federal Reserve System¹²

The panic of 1907 brought home to the public the shortcomings of American banking in a way that no amount of academic discussion could do. A preceding period of heavy speculation centering in New York was financed largely by deposits from the banks of the interior and by loans from Europe. In spite of help from the Treasury, discount rates rose violently and deficits occurred in the lawful reserves of the banks. When the banking situation reached a crisis in the fall of 1907, several of the trust companies failed and seriously involved some of the commercial banks. As the news spread throughout the country, the banks of the interior demanded the return of the funds that they had on deposit in New York, but monetary payments had been suspended there, an action that was soon followed throughout the United States. Instead of permitting frightened depositors to denude the banks of their cash, banking holidays were declared in certain states, and in many places withdrawals were limited to a small weekly or daily amount per customer. Banks and business firms printed substitutes for money or issued checks good for deposit but not for cash. In New York, at the height of the panic, money went to a four per cent premium over bank deposits.

¹² For a thoroughly readable discussion of the structure and functions of the Federal Reserve System, see *The Federal Reserve System—Its Purposes and Functions*, published by the Board of Governors in 1939.

The demand for monetary and banking reform now became so persistent that Congress in 1908 created a National Monetary Commission, which was to make a thorough study of the monetary and banking structures and experiences of other countries as well as of the United States and report a plan for revamping our financial system.

The Commission held interviews with the world's leading experts in the field of currency and banking, and a large number of studies embracing every important phase of the subject were prepared by authorities in the respective fields covered. Out of this wealth of material was evolved the Aldrich Bill, which was introduced in Congress in 1911.

Although the measure had much to commend it, there was no hope for its passage. The Democrats already controlled the lower House, and at the ensuing election they obtained the presidency and control of the Senate. They promptly proceeded to draft a bill more to their liking. After many changes, a measure was finally enacted in December, 1913, under the title "the Federal Reserve Act."

Instead of setting up a central bank, Congress respected the long-standing prejudice against such institutions by providing twelve regional banks, each to be located in a financial center of importance and owned by the banks of the district that became members of the System. In order to give some degree of unity and co-ordination, a Federal Reserve Board (now called the Board of Governors of the Federal Reserve System) was placed at the head of the organization. Every national bank was required to become a member of the federal reserve bank of its district. Since Congress lacked the authority to compel state banks to become members, it had to make membership optional with them.¹³

The most important contributions which the Federal Reserve System has made to American banking are:

First. The nation's legal banking reserve, aside from that of non-member banks, has been placed in the hands of the quasi-public federal reserve banks instead of being largely under the control of other banks operated solely for profit, as was the case before 1914. Moreover, since much of the required reserve of nonmember banks was carried in member institutions, the Federal Reserve System has some indirect control over that part of the reserves also. As a protection to the member banks and Government deposits carried with them, the reserve banks, in their turn, are required to carry a lawful reserve of at least 35 per cent.

Second. There has been provided a type of currency, the federal reserve note, that is free from the restrictions that prevented the supply of national bank notes¹⁴ from expanding in accordance with the need for more currency. There is no ceiling upon the total amount of federal

¹³ On June 30, 1942, there were 6,647 member banks—5,101 national and 1,546 state. *Federal Reserve Bulletin*, August, 1942, page 817.

¹⁴ These notes were retired in 1935.

reserve notes that can be issued save that a reserve of at least 40 per cent in gold certificates must be held, and certain prescribed assets of the federal reserve bank issuing the notes must be held as additional security. With close to 90 per cent of business transactions now settled by the use of checks, the question of elasticity in the supply of money is not so important as it was a generation ago. When more money is needed, it can be made available immediately with a minimum of cost and red tape.

Third. The combined resources of the twelve federal reserve banks are available to supplement the supply of credit that the individual member banks have to offer to their borrowers. A bank whose reserve has fallen to the legal minimum can sell some of its customers' paper to its reserve bank or borrow on its own note, secured to the satisfaction of the reserve bank, and thus be able to meet additional demands on the part of its constituents. If one of the reserve banks extends credit to a point where its own lawful reserve has fallen to the legal minimum—35 per cent—it may rediscount some of its paper with other reserve banks. Thus, the twelve institutions function as a single central bank.

Fourth. The Federal Reserve System has rendered valuable service to the Government. Since the reserve banks took over the duties of the system of subtreasuries some years ago, they have supplied the banks and the public with the various kinds of money they require, have eliminated counterfeits and badly worn money from circulation, and have acted as depositories for certain Government officials like postmasters and internal revenue collectors. They have facilitated the distribution of new Government security issues, paid interest coupons, and aided in the retirement of called or matured securities.

Fifth. The Federal Reserve System contributes to the unifying of the heterogeneous decentralized American banking structure with its dual type of national and state banking—the latter operating under 48 separate jurisdictions. The Board of Governors, with its extensive regulatory power over both federal reserve and member banks, tends to co-ordinate banking policies and practices and to compensate in large measure for the lack of a single central bank.

Sixth. The seven members of the Board of Governors and five representatives chosen from the twelve reserve banks serving as the Federal Open Market Committee direct the purchase and sale of Government securities on the open market as a means of curbing or increasing the available supply of credit. In addition, the Board may employ the following powers for correcting unsound expansion or contraction of credit: (1) increase or decrease the reserve requirements of member banks; (2) refuse to approve loan and discount rates set by reserve banks; (3) deny the request of a reserve bank for more federal reserve notes; (4) change the maximum rate of interest that banks may pay on

time deposits; (5) stop further extension of credit to member banks deemed overextended.

The Reserve System has met adequately the two principal objectives that its sponsors had in mind: the provision of an elastic supply of currency, and the mobilization of the banking reserves of the country in the twelve reserve banks, where they serve as the basis for the extension of credit wherever additional supplies are needed. In addition, it has contributed substantially to better business and banking practices and has rendered invaluable service to the Federal Treasury in connection with its currency and fiscal operations.

With respect to the stabilization of the credit structure through its open-market operations, changing the discount rate, and other devices at its command, the record of accomplishment of the federal reserve authorities has not been consistently good. So far as the correction of lesser fluctuations in the supply of credit are concerned, they have met with commendable success, but in the case of the major booms and depressions the measures of control taken by the Reserve System have availed little.

The fault, however, has not rested entirely with the federal reserve authorities. They have always been hampered by the fact that only a part of the nation's banks are under their jurisdiction and that they must share with other Government agencies the responsibility for the regulation of the conduct of their own member banks. Since 1933, although improved devices have been provided them for dealing with the problems of credit control, the huge influx of gold into the United States and the greatly increased monetary powers accorded the Secretary of the Treasury have materially lessened the ability of the Reserve System to deal with serious credit disturbances. However, it can continue to smooth out minor disturbances with its usual effectiveness. Any major threats of credit inflation or deflation hereafter should be the concern of the whole Government and such special measures be devised as will be likely to bring the situation under control.

Monetary and Banking Policies Since 1933

After a relatively short post-war depression from 1920 to 1922, there followed seven years of good times. Industrial production soared to new heights. The widespread ownership of Liberty Bonds in the First World War had stimulated investment in securities by the general public. As a result, investment bankers were able to distribute many billion dollars' worth of both domestic and foreign issues. The commercial banks, encouraged by the "easy money policy" of the Federal Reserve System, greatly expanded their loans. Unfortunately an increasing proportion of this new credit was employed in speculation in real estate and securities, leading in both fields to an excessive volume of transactions and totally unwarranted prices. The inevitable collapse in the real estate boom

came in 1927, but the orgy of speculation in stocks continued until it reached its crisis in the autumn of 1929. There followed a period of depression unprecedented for its severity and length. It manifested itself in a violent recession in business activity, widespread unemployment, a sharp decline in the prices of commodities and securities, and wholesale failures of banks.

When Franklin D. Roosevelt assumed the office of President on March 4, 1933, the country was in the midst of a severe banking crisis. State after state had proclaimed banking holidays in an effort to stop runs by depositors. Money was being hoarded and gold exported. Large numbers of banks, unable to collect their loans or sell their investments, except at a staggering discount, had closed their doors.

One of President Roosevelt's first acts was the declaration of a nationwide bank holiday and the forbidding of the further export of gold. His action was confirmed three days later by Congress, which placed in his hands the control of dealings in foreign exchange and gold and prescribed a plan for reopening those banks which an examination showed to be sound, and for the placing of a conservator over those in questionable condition. The latter institutions eventually were either restored to normal operation or liquidated. This "housecleaning" of the banking structure, coupled with reforms which will be discussed in the succeeding section, served to place American banking on the most satisfactory basis it had yet attained.

The collapse in prices, particularly those of farm products, brought forward schemes for "reflating" the price level. The Thomas Amendment to the Agricultural Adjustment Act of 1933 not only authorized the President to resort to the familiar remedies, greenbacks and free coinage of silver, but added two others: federal reserve purchases of Government securities on the open market, and reduction in the gold content of the dollar.

Of these Mr. Roosevelt employed the reduction of the gold content of the dollar. Accordingly, in the fall and winter of 1933-1934, the weight of the standard gold dollar was reduced from 25.8 grains (9/10 fine) to 15.24 grains. The theory underlying this remedy was that a dollar which was but 59.06 per cent of its former size would buy only 59.06/100 as much in commodities and services. Prices, therefore, would tend to rise to 100/59.06 of what they were before. Undoubtedly this action did exert an inflationary (or reflationary) influence upon prices, but so many other factors act to determine the price level that it is impossible to trace the effect of any one. Suffice it to say, there was a gradual recovery of business following 1933 but no significant increase in prices until the entrance of the United States into the Second World War ushered in a price inflation of such magnitude as to constitute a serious threat to the war effort and the standards of living of families.

Thus the problem of reflation and the devices for bringing it about soon ceased to have any but a historical interest.

As an accompaniment of the power to change the content of the gold dollar, all gold coins and certificates had to be surrendered to the Government, which proceeded to melt the coins into bars, to destroy the certificates, and credit itself with a "profit" of \$2,800,000,000. All types of money were made full legal tender and could no longer be exchanged for gold, except by licensed exporters of gold or by industries that use it as raw material. The latter arrangement, plus the fact that the Government will buy all gold offered to it at a price fixed by the President, within certain specified limits, still leaves the United States upon a tenuous sort of gold standard.¹⁵

Although outright restoration of the free coinage of silver was not achieved, a powerful bloc from the silver-producing states succeeded in obtaining a number of concessions from the administration. The principal measure was the Silver Purchase Act of 1934, which directed the Secretary of the Treasury to buy silver until the value of the Government's stock should equal one-third that of its gold stock or until the market price of silver should equal the face value of the silver in the silver dollar (\$1.29 + an ounce).

The Secretary proceeded to make heavy purchases of silver, but the tremendous influx of European gold into the United States, plus the record-breaking output of new gold, which had been stimulated by the attractive price of \$35 per ounce, made it impossible to achieve the goal set. In spite, therefore, of a silver stock aggregating more than two billion dollars on June 30, 1942,¹⁶ the relation between the two stocks was about where it was when the Silver Purchase Act was passed. In addition to this generous concession, it was provided that the Government must buy all newly mined silver at an artificially high price¹⁷ in order to stimulate production.

These and other similar costly and ill-advised measures succeeded in stimulating silver production, raised its price a little in the world market, and fattened the pocketbooks of silver-mining interests, but they saddled the country with an enormous amount of unwanted metal. True, much of it found its way into circulation in the form of silver certificates, but the same purpose would have been served at a negligible cost by increasing the volume of federal reserve notes.

The monetary policies of the Roosevelt Administration were aimed largely at the termination of a prolonged state of subnormal business

¹⁵ Under the Gold Reserve Act of 1934 the weight of the gold dollar can be varied between 50 and 60 per cent of its former weight (25.8 grs.). The figure of 59.06 per cent mentioned above has not been changed. This makes an official price of \$35 per ounce.

¹⁶ *Federal Reserve Bulletin*, August, 1942, p. 815.

¹⁷ 71.11 cents per ounce since 1939.

—a condition that was eventually brought to an end largely by the rearmament program of the United States and the subsequent full participation in the Second World War.

Along with a huge public works program and generous payments to the unemployed, the cheapening of the dollar was intended to restore prices, increase individual incomes, and stimulate business recovery. That better results were not achieved was due partly to the fear and uncertainty which the New Deal program created in the minds of businessmen and investors.

The silver legislation and the extensive purchases made under it were the least justifiable part of the program. The money placed in circulation through its operation merely displaced other less costly currency. The only stimulation to business came from the increased activity in silver mining, an industry which cuts but a small figure in the nation's total production. Moreover, while contributing little at home to the cause of recovery, the silver program was playing havoc with the national economy of China and other silver-using countries.

Recent Trends in Banking

The revolt in the 1830's against a central bank and in favor of free banking, which made it possible for anyone to engage in banking by fulfilling a few easy requirements, has given to the United States a banking structure entirely different from that found in other countries. Until 1914, there was no institution that performed the functions of central banking as they are now understood, and, when provision was finally made for these functions, twelve regional banks and a supervisory board were instituted instead of a single central bank. As has been indicated earlier, however, the Federal Reserve System has acquired more of the character of a central bank. While some areas have broken away from a strictly independent unit system, by permitting banks to establish branches within a state or county or city, public sentiment has been strongly opposed to interstate branch banking. Consequently there has developed a system largely composed of small units, as opposed to the European and Canadian systems, where a few large metropolitan banks serve the entire nation through their branch systems.

At the time the national banking system was developed, the idea, inherited from Great Britain, prevailed that a bank, in order to be sound, should confine its services very largely to the making of self-liquidating commercial loans. Banks have never fully lived up to that idea, and as new opportunities for profit have presented themselves, they have departed farther from it. Laws have been liberalized to accord with the ever-broadening concept of the banking functions. As a consequence, American banks have developed into department stores of finance. They have come to lend upon the security of real estate and to finance the purchase of automobiles, household equipment, and other relatively

costly articles of consumption. They have established trust and savings departments and developed personal loan departments. Instead of confining their financing of business to seasonal working capital requirements, they have introduced serial loans with final maturities of five or ten years.

In 1933 banks were forbidden to engage in the underwriting of bonds and stocks of private corporations, but their investment departments were still permitted to float civil obligations and to procure and dispose of other types of securities for their patrons. Changes in business methods gradually lessened the relative volume of accommodation obtained by business firms from banks. As a consequence, the constantly growing volume of bank deposits has been diverted more and more to the purchase of investment securities. The tremendous increase in the outstanding volume of obligations of the United States Government, accompanied by a lull in the issue of securities by private corporations, has resulted in constantly mounting portfolios of Federal securities in banks. The impact of Government upon banking in the United States has been growing. Stricter requirements for entering the business and more rigid standards have been imposed. A Federal Deposit Insurance Corporation was established in which banks could insure their deposits up to \$5,000 per account. Increasing competition has been offered the privately-owned banks by the operations of the Reconstruction Finance Corporation, the group of institutions administered by the Farm Credit Administration, and other Government-sponsored agencies. Banking in America today, thanks to the elimination of weak institutions through the numerous failures of the 1920's and 1930's, plus absorptions by other banks—-independent or branch institutions—is stronger than it ever was. Requirements are more rigid and supervision is more efficient. Public confidence has been greatly bolstered by deposit insurance.

The forty-nine systems of regulation provided for national and state banks, even when unified to some degree by the Federal Deposit Insurance Corporation and the Federal Reserve System, are too many. While the standards of some of the states are on a par with those of the national system, many of them are not. Branch banking is no cure-all, but it should be extended. It is at least a much better method of serving rural communities and city neighborhoods than is the creation of so many small independent units.

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CHAPTER 28

The Investment Market After the War Between the States

THE MARKET for long-term or capital funds had developed very slowly during the first half of the nineteenth century, and had reached only a low degree of specialization when the War Between the States broke out. The war gave an impetus to this process, greatly accelerating the rate of development, first by reason of the need of the Government for funds with which to carry on the war, and second by reason of the expansion of industry that accompanied and followed the war.

The borrowers who formed the demand side of the capital market in this period were the business entrepreneurs, particularly railroad builders and factory owners, who took the place formerly occupied by the canal and road builders. On the supply side of the market were the thousands of individuals who spent less than their income and had something left over to invest in stocks, bonds, savings deposits, or insurance. Corporations also frequently added to the supply of capital by adding to their equipment out of their own profits or by investing their profits in other business enterprises. Usually, in the case of individuals, and occasionally in the case of corporations, the process of transferring funds from the saver to the borrower requires the services of an intermediary. This intermediary, in a highly industrialized society like the United States, is the investment market, with its array of specialized investment banks for underwriting new issues and brokerage houses for distributing them. Like most other financial institutions, this market developed slowly by a process of gradual specialization of function, and in its early stages can hardly be distinguished from other forms of financial operations. By the time of the War Between the States, a number of merchant bankers had given up mercantile activity and concentrated upon finance, and a number of new firms had been organized specifically for that purpose. The large-scale financial operations necessitated by the war merely accelerated a process of evolution that had been going on in previous years at a more moderate rate.

Jay Cooke and the Financing of the War Between the States

When Salmon Portland Chase took office as Secretary of the Treasury in March, 1861, on the eve of the war, he was confronted with a national debt already high for that period and a public credit already

impaired. Although the Government finances had been managed since 1846 under the Independent Treasury Act, which was designed to make co-operation with banks unnecessary and even impossible, the situation was so critical that the Secretary found himself impelled to ask the banks for aid in supplying the Treasury with funds. The banks agreed to lend \$150,000,000 in three installments. Unfortunately, the Secretary insisted that the payments be made in specie, according to the letter of the law, and this drain upon their reserves soon forced the banks to suspend specie payments altogether. With the banks unable to give further aid, and European investors unwilling to buy United States bonds because of the crisis, it was soon obvious that even the issue of paper money in the form of greenbacks would not meet the needs of the Government in carrying on the war. Some other resource had to be found.

At this point Jay Cooke persuaded the Secretary to put in his hands the sale of Government bonds to the public. Cooke was an enthusiastic and energetic young financier from Ohio, Chase's native state.¹ He had been trained at the banking house of E. W. Clarke and Company of Philadelphia, in the conservative methods then in vogue for selling new corporate issues—by personal calls on customers. In order to obtain wider scope for his talents, he had formed his own company in 1861, and with Drexel and Company had sold an issue of Pennsylvania state bonds to the general public by appealing to their patriotism.

On the basis of this experience, Cooke conducted a series of Federal loan campaigns, using salesmen, newspapers, billboards, and all the devices then known to advertising to keep the bonds constantly before the public eye. His method was successful; great quantities of bonds were bought by people who had never before owned securities, and the Treasury was provided with funds that otherwise would have had to be obtained by the dangerous method of further issues of greenbacks. The national debt had risen from less than \$100,000,000 before the war to more than \$2,500,000,000 after the war, an increase from about \$3 to about \$77 per capita. As for Jay Cooke, although his rate of commission was moderate, the volume of bonds sold had netted him a handsome profit; he had gained the gratitude of the Government, prestige among the people, and valuable experience, all of which he turned to good account in the years that followed.

The Post-War Boom, 1865–1873

The technique that had been so successful in selling Government bonds during the war was applied in the following period to corporate securities, especially to railroad issues. Up to this time the number of

¹ Henrietta Larson, *Jay Cooke, Private Banker*, gives the best account of his life. Cambridge: Harvard University Press, 1936.

industrial issues available for investors had been extremely limited. But when the business enterprise became so large that no single person or group of partners could provide enough capital to set it in operation, it became necessary to sell stocks and bonds to a wide public, which often lacked any direct contact with or knowledge of the enterprise. The new type of investment banker filled this gap.

The years between 1865 and 1873 were boom years in the victorious states of the North. Moreover, the West was growing rapidly in population and in wealth. The great need of the times was better transportation facilities, and 30,000 miles of new track were laid in those years. The funds with which these lines were built were raised largely by such houses as Jay Cooke and Company, using the methods developed during the war bond campaigns to persuade investors to take the bonds issued by the Northern Pacific, the Chesapeake & Ohio, the New York, Ontario & Western, and other roads. In some cases the clients were even urged to sell their Government bonds and invest in railroad bonds, which offered a higher return.

Many of these railroad issues were bought not by investors, but by speculators who had little interest in the good management of the railroad and were concerned only with immediate profits to be made out of Stock Exchange trading. As a result the Exchange became the arena for historic conflicts between the "bulls," who tried to make profits by forcing stock prices up, and the "bears," who made profits by selling short what they did not yet own, forcing prices down, and then buying at the lower price what they had already sold at the higher. The New York Stock Exchange in this period had little control over the trading carried on under its roof. It was organized as a partnership and was conducted almost like a private club, with each new member buying a "seat," which represented his right to carry on trading in the Exchange. The roll of listed securities was read out at stated times each day and prices noted, but most of the trading was actually carried on between roll calls. Corporations made no regular reports to stockholders or the Exchange. There were not even listing requirements until a series of scandals in connection with Erie Railroad issues finally gave the Exchange the courage to rule that after January 30, 1869, no company might have the privilege of listing unless it kept a registry of all its outstanding issues with an approved agency, bank, or trust company.

In the absence of any effective regulation, and in the existing state of business morals, traders in securities were able to manipulate prices through corners, pools, and other devices now illegal. The most prominent individuals in this group of speculators were Daniel Drew, Jim Fisk, and Jay Gould. Daniel Drew² entered the New York scene by

² An interesting account of his life is given by Bouck White in *The Book of Daniel Drew*. New York: George H. Doran Company, 1910.

bringing droves of cattle into the city from upstate, feeding them salt on the way, and not allowing them to quench their thirst until just before this "watered stock" was weighed for purchase by the city butcher. This sort of unscrupulous ingenuity soon enabled him to gain a fortune and become a stock trader. He sometimes worked with, and sometimes against, Gould and Fisk, was prominent in the Erie scandals, founded a theological seminary, and in his old age complained that even his own grandchildren would not trust him to invest their money for them. Jim Fisk was involved, not only in the manipulations of Erie stock, but also in the attempted gold corner of "Black Friday" in 1869, which involved Government officials as well as stock market operators.

Jay Gould was the only one of this group who evidenced any constructive ability as a businessman. He too came from a small town in upper New York State; but he spent his spare time in studying accounting and surveying, and got his start in the railroad business by reorganizing a small railroad, making it pay, and then selling it at a profit. Unlike his associates, he understood the operation of railroads as well as the manipulation of their securities. In 1859 he set up as a stockbroker in New York City, and with Drew and Fisk soon gained control of Erie. He then proceeded to make himself wealthy at the expense of the railroad and of his associates. When the outraged stockholders finally forced him out of the Erie management, he turned his attention to the new railroads of the West. By depressing stock prices and then buying, he had gained control of 10,000 miles of road at the peak of his power. His methods remained unchanged in this new field, and the new series of scandals associated with his roads led eventually to Government investigation and reform legislation.

One other figure of this period who figured prominently in the speculative markets was Cornelius Vanderbilt, but he differed from the others in being an entrepreneur as well as a speculator. His early life was spent in sailing, first a ferryboat between Staten Island and New York, then a coastwise trader. He was one of the first to recognize the possibilities of the steamboat, and after serving a long apprenticeship under another owner, finally launched out for himself. In the face of violent opposition he established a line of Hudson River steamboats that won him the title of Commodore; then he went upward in the nautical scale and operated boats to Panama during the California gold rush and eventually ocean liners to Europe. It was not until 1857 that he turned his attention to railroads. As director and then president of the New York & Harlem road, he came into conflict with Drew and was obliged to engage in stock market activities in order to prevent Drew from buying up all the stock in the market and wresting control from Vanderbilt. By 1873 he had gained control of the Hudson River line,

the New York Central, and the Lake Shore & Michigan, and welded them into the new and integrated New York Central, which was one of the first of the big railroad systems. In this later period Vanderbilt was as arrogant and unscrupulous as his opponents, resorting even to bribery of judges when it served his purpose.

Much of this unprincipled manipulation of stock prices would have been impossible if the issue of new securities, the refunding operations, and the conversion of bonds into stock had been subject to legal regulation or had been disapproved by the public opinion of the time. But the mores of the period set the making of money above all other considerations, and the successful man was judged to be the man who made a fortune. The investment bankers themselves rather encouraged than discouraged such manipulation, and even a highly respected house like that of Jay Cooke was not above speculating on its own account.

The orgy of speculation came to an end with the panic of 1873 and the collapse of Jay Cooke's banking house and the Northern Pacific bonds which he had sponsored. Several other banking houses which had grown up since the War Between the States also collapsed in this panic. Financiers interested in railroads after this period were obliged to pay somewhat more attention to the development and operation of the lines, since the disillusioned public was less ready to accept securities without regard to the underlying values. Some of the roads never recovered from the financial mismanagement of that early period, which loaded them with debt. Erie paid no dividends on its common stock until three-quarters of a century later, in 1942.

The Beginning of Large-Scale Industries

The period after 1873 was marked by a great increase in the number of corporations among industrial enterprises. With the widening of the market due to the increasing population of the country and the improved transportation facilities, and with the steady progress of invention stimulated by the possibility of large-scale production, big business became possible and profitable. The selling of corporate securities for industry was taken over by investment bankers, who had already become accustomed to handling Government and railroad issues. It is true that some small enterprises were still able to raise funds locally, but the larger units were obliged to turn to the great financial centers for aid.

The effect of this development may be seen in the listings on the New York Stock Exchange. Before the War Between the States, the list had consisted largely of Government issues and the securities of banks, insurance companies, canals, and a few railroads. By 1867 there were 15 industrial stocks and 63 rails; in 1913 the industrials had risen to 191, while the rails had risen only to 147—a thirteenfold increase for

industrials as compared with little more than doubling for rails. Other stock exchanges throughout the country showed the same trend.

Although the industrial issues gained a place beside the rails in the listings of the Exchanges, they were at first viewed with considerable suspicion by bankers and investors. The bankers refused to allow industrial securities to be used as collateral for loans on the same terms as rails until well into the twentieth century, while conservative investors continued to prefer rail issues, leaving the industrials to the speculators. Toward the end of the century mining shares began to be bought and sold on the market, but they also were viewed with suspicion, much of it justified. Some of these issues were refused listing by the New York Stock Exchange, either because they were too speculative, or because they were not widely enough distributed to provide a broad market; consequently, these shares were often traded on the "Curb" market, which was held in the street outside the Exchange until it acquired a roof over its head in 1921.

Types of Securities in the Investment Market

Although stocks are far more important than bonds in trading on the exchanges, where old issues are bought and sold, the reverse is true in the investment market, where new issues are distributed. Stock is normally issued only once and usually remains outstanding during the life of the corporation. Bonds, on the other hand, are a form of debt that must be periodically repaid or refunded, and each renewal or increase of the debt means a new issue in the market. In addition to this reason for the preponderance of bonds, there has been a preference for bonds among certain groups of investors. Many banks and insurance companies are not permitted by law to buy common stocks, but are able to purchase bonds of good quality, so that bonds often find a market that would be closed to the stocks of the same corporation. Corporations themselves, when faced with a choice between increasing their capital stock or borrowing, often choose the latter course, either because the majority stockholders do not wish to share control with outsiders, or because they do not wish to share the expected high earnings. The tax laws of the United States and many states have furthered this tendency by permitting corporations to count interest on bonds as an expense to be deducted from net income in computing taxes, while dividends on stock are regarded as corporation income and therefore subject to taxation.

Types of Investment Banks

The investment banking houses that functioned in the period after 1873 may be considered in two groups. In the first place, there was a rather small number of strictly domestic firms, located not only in New

York City but also in such rising centers of the West as Chicago and St. Louis. N. W. Harris & Company of Chicago, for example, the forerunner of Harris, Forbes & Company, handled municipal securities and mortgages as well as the usual rails and industrials. Other companies in this domestic group issued their own debentures secured by mortgages. There had not previously been a systematic market for mortgages in the United States, and the public response to this type of security was at first favorable. A considerable volume of such securities was placed in the market, chiefly in the West, during the 1880's. Some of the companies took out licenses for selling in New York as well, but this attempt to invade the strongholds of Wall Street was not very successful. In the panic of 1893 some of the mortgage companies failed, and the volume of trading in such securities declined, never to revive in that form. The companies that carried on more varied activities were more successful in weathering the panic.

A second group of houses that came into prominence after 1873 had important international connections. The American security market had always been dependent upon Europe for help in floating large issues; in the period before the War Between the States, Baring of London, Hottinguer of Paris, and Hope of Amsterdam had been in close touch with the bankers of the United States, and many American bonds had been sold through their offices. In these early years the relation had often taken the form of a representative of the foreign house stationed in New York City. After 1873, however, the Americans began to establish branches in foreign cities, thus shifting the center of gravity and preparing for the day when the United States would cease to borrow abroad and begin to be a lending nation.

Outstanding among American investment bankers was the house of Morgan. The family had been engaged in the brokerage business in New York City since 1853, when Junius Spencer Morgan became a partner of Peabody & Company, but it was not until 1871 that an association with the Drexels gave the firm important foreign connections in London and Paris in addition to those in New York and Philadelphia. With this added strength, the firm was able to force the Rothschilds and Jay Cooke to share with them the \$300,000,000 Government loan of 1873; and when Cooke & Company failed, later in that year, the Morgan firm was left in undisputed leadership of the investment field.

By this time young Pierpont Morgan was active in the firm. He had been educated abroad, specializing in mathematics in Germany. His particular talent for finance first became apparent when William Vanderbilt, the son of the Commodore, found himself unable to keep control of the railroad empire built up by his father and appealed to Morgan for aid. Morgan was able to make a sale of 250,000 shares of New York Central in England without breaking the market, and so saved

Vanderbilt; but in return Morgan received \$3,000,000 and the right to put his nominee on the Board of Directors of the railroad. He then proceeded to build up the system by buying up the West Shore Railroad, which operated on the other side of the Hudson, thus giving the New York Central a virtual monopoly of rail traffic along the river.

This device of insisting upon a share in managerial control before granting credit was used many times by investment bankers. Another financial device by which bankers were able to gain control of industries for which they had floated security issues was the voting trust, by which a special corporation was set up for the purpose of holding the securities of a number of related companies and securing unified management and policy. The reorganization of the Richmond & West Point Terminal Railway & Warehouse Company was accomplished by this measure in 1894. The frequent railroad bankruptcies of the 1890's provided a strong firm like Morgan's with many opportunities for lucrative reorganization, by means of voting trusts, interlocking directorates, and the like.

The technique that had been worked out for railroads was later applied to industrial companies and resulted in the formation of a number of important mergers. The most important of the operations carried out by the aid of the Morgan firm was the formation of the United States Steel Corporation out of a group of smaller enterprises. The tangible assets of the combined companies were valued at \$682,000,000, but the new merger was capitalized at \$1,400,000,000. The Morgan firm received not only the fee of \$12,500,000 for underwriting the issue, but also a share of \$50,000,000 in the profits of the syndicate that supported the issue when it was first put on the market. Other combinations sponsored by Morgan were the General Electric Company, which gradually extended its operations into many foreign countries as well as throughout the United States, the International Harvester Company, which controlled many types of farm machinery, and the International Mercantile Marine Company, which was a conspicuous failure in its effort to dominate the transatlantic shipping business.

Morgan's was not the only investment banking house that was active in the combination movement. Many other bankers co-operated with Morgan or took the lead on their own account in floating securities of this sort, and in the peak years, 1899-1901 inclusive, 200 industrial combinations were formed, with a total capitalization of \$10,000,000,000. This activity in the flotation of new issues was inevitably accompanied by an increase in trading on the New York Stock Exchange, which rose from a total of 57,000,000 shares in 1896 to 266,000,000 in 1901, while bond dealings in the same period rose from a total of \$394,000,000 par value to \$999,000,000 par value.

During the combination era there developed that close integration of

the whole financial system that on the one hand led to many abuses and complaints of banking monopoly and on the other hand greatly facilitated the formation of large-scale enterprises. Investment bankers extended their interests into the fields of commercial banking, insurance, and industry itself. Partners in the investment banks became directors of industrial corporations that floated their new issues through the banks; others became vice-presidents of commercial banks and trust companies that bought new issues from the investment banks; others became officers of insurance companies that were heavy buyers of securities. These interlocking directorates, reinforced by such devices as holding companies and bank trustees for corporate issues, created what was popularly known as the "Money Trust."³

Criticism of this financial hierarchy became more severe after the panic of 1907 and brought about an investigation in 1908 by a committee appointed by Governor Hughes of New York State. The report of this committee did little but point out the difficulty of effective regulation. Several years later the subject was taken up by a committee of the United States House of Representatives under the chairmanship of Mr. Pujo, who carried on a much more searching inquiry in response to the order to lay before the public "full and complete information on the banking and currency conditions of the United States for the purpose of determining what regulation is needed." The report of this committee was published in 1912 and gave impetus to the public demand for drastic regulation of banking. The election of Wilson to the presidency and the ensuing passage of the Federal Reserve Act were the results of this agitation, although in fact the situation with respect to investment banking was little changed by the new legislation. The Federal Reserve System was designed to control expansion in the commercial banking field and almost ignored the close connection between commercial and investment banking. The failure to establish some sort of control over the capital market at this time left the way open for the difficulties of the 1920's, which followed the financing of the First World War.

The Financing of the First World War

The outbreak of the First World War in 1914 marked the beginning of another period of rapid change in the investment market of the United States. The country was shifted violently and with inadequate preparation from a borrowing to a lending position among nations, and became in the course of a very few years the world's greatest creditor nation. The war was hardly under way before the Allied nations began to

³ Many examples of these are given by Louis D. Brandeis in *Other People's Money and How the Bankers Use It*. New York: Frederick A. Stokes Company, 1914.

borrow and spend in the United States. By the end of 1916 the total of loans to the Allied governments amounted to nearly \$2,000,000,000, and the resources of private credit were about exhausted. If no further credit had been extended to them, their purchases in the United States would have been greatly reduced and a serious depression would have resulted; how much this had to do with the entry of the United States into the war on the side of the Allies in 1917 is still a hotly debated question.

The declaration of war by the United States put at the disposal of the Allied governments the public credit of the country as well as the private credit of a host of banks and investors. The loans that were floated by the Treasury in the next 30 months carried the American public debt from \$1,300,000,000 in April, 1917, to a peak of nearly \$27,000,000,000 in August, 1919—in per capita figures, from about \$13 to about \$250. About one-third of this total arose from loans by the United States Government to the Allied governments.

The task of distributing such an unprecedented volume of securities among the investors of the United States taxed to the utmost the facilities of the investment market and led to a revival of the methods used by Jay Cooke in the War Between the States. Newspaper and billboard campaigns, rallies on street corners, and public meetings were used to supplement the usual procedures for selling bonds to the public. Banks not only bought bonds and short-term Treasury notes and certificates of indebtedness for their own portfolios, but they also loaned on easy terms to individuals who wished to buy. Nearly 12,000,000 persons subscribed to the Victory Loan of 1918. Many who bought these bonds had never before been owners of securities, and the habit of direct investing rather than of making deposits in a savings bank undoubtedly facilitated the wide public participation in the boom of the late 1920's.

In order to clear the way for the war issues by reducing to a minimum the issue of industrial securities, the War Finance Corporation Act provided for a Capital Issues Committee to be appointed by the President. This committee had no punitive powers under the Act, but depended upon the co-operation of the financial community for its effectiveness. It disapproved about one-fourth of the issues presented for its scrutiny. Perhaps the most important aspect of the committee's work was that it set a precedent for Federal regulation of security issues.

The war period and the immediate post-war period were marked by a great expansion of industry and agriculture as the United States was called upon to feed and equip her allies during the war and much of Europe after the war. These conditions set the stage for a great speculative boom in securities, which was furthered by the low interest rates

maintained by the Federal Reserve authorities; by the influx of gold, which provided the basis for an expansion of bank loans; by the lowered reserve required against deposits of member banks in the Reserve System; and by the boom that was under way in several other countries during this period. The recession of 1921 lowered consumer-goods prices somewhat and was a severe blow to agricultural producers, but it did not put an end to the flourishing state of industry. There were minor recessions also in 1924 and 1927, but on the whole the decade after the war was one of considerable activity in all lines except agriculture.

With industry equipped to meet the needs not only of the United States but also of Europe, one of the problems was to provide Europeans with purchasing power to buy American goods. Here the already developed mechanism for bond sales was put to effective use, and bond house representatives from the United States toured the continents of Europe, Asia, and South America, offering the opportunity, and sometimes giving inducements, to public officials to borrow on easy terms. The American public, excited by the rise in stock prices at home, did not trouble to examine closely these foreign security issues, and took an estimated \$15,000,000,000 worth of them in the decade before 1929.

Foreign investment comprised only one aspect of the boom of the 1920's. There was a boom in Florida real estate that attracted erstwhile stock market speculators as well as many inexperienced investors. This boom collapsed in the middle of the decade, pulling down with it many Florida banks. Most prominently, the boom in the stock market carried stock prices up so rapidly during 1928 and part of 1929 that many buyers ignored everything except the possibility of selling again in a few days at a higher price. The turnover of shares became so rapid that the facilities of the New York Stock Exchange were taxed to the utmost.

One feature of this boom was the great increase in call loans on security collateral, by which brokers financed the transactions of their customers. Such loans had long been made by the New York banks for their out-of-town correspondents, and during this period they made them also for the accounts of corporations. This sort of financing added an element of danger to an already topheavy financial structure. On the first hint of a decline in security prices, the corporations withdrew their funds from the market without warning, leaving the banks with the full burden of carrying their broker customers. This made the decline in prices, once started, more precipitous than it would otherwise have been. The Securities and Exchange Act of 1934 forbade brokers to borrow on call from any but member banks, and thus took corporate funds out of the call loan market.

Besides its effect upon their call loans, this period created another problem for the commercial banks. Business enterprises that had in

the past obtained funds on short term from commercial banks found in many cases that they could more conveniently borrow on long term in the security markets. As a result, the commercial banks were able to make smaller amounts of short loans and were impelled to invest more heavily than formerly in securities. Moreover, even in the case of direct loans to corporate borrowers, the period of the loan tended to be lengthened and the proportion of "term loans" running from three to ten years was increased. This condition increased the proportion of long assets and reduced the liquidity of the banks, creating a potential danger for the banking system.

Moreover, many banks embarked upon a new activity, or expanded an existing one, in the form of the security affiliate. These affiliated institutions, although completely owned by the parent bank or its stockholders, could engage in the underwriting and distribution of new stocks and bonds without the restrictions placed upon the lending activities of commercial banks. By 1927 such affiliates were handling one-eighth of the originations of security issues, and by 1930 one-half. The decline in stock prices in 1929 not only reduced the earning power of these affiliates by making new issues difficult to float, but also reduced the value of their existing inventories of securities.

The system was so obviously dangerous that the Banking Act of 1933 contained as one of its chief provisions a clause requiring all member banks to dispose of their affiliates within a year's time and forbidding all investment banks to receive demand deposits. This dictum amounted to a complete separation of commercial and investment banking. Some of the older investment houses chose to retain their deposit business. J. P. Morgan, for example, became a bank of deposit and turned its investment business over to a firm consisting of former Morgan partners, Morgan Stanley & Company. Kuhn, Loeb & Company, on the other hand, retained the investment business in which it had been engaged for three-quarters of a century and divested itself of its demand deposits. Other clauses in the new banking laws that directly affected the investment market were those which gave power over margins for security trading to the Board of Governors of the Federal Reserve System and permitted the Reserve Banks to limit the rediscounting of member banks that were too heavily involved in security loans.

Concentration of Investment Banking

The business of investment banking⁴ is inevitably concentrated in the larger cities of the country, especially New York City, where many corporations have their offices and where the Stock Exchanges are lo-

⁴ The recent activities of investment banking houses are described in great detail in Parts 23 and 24 of the *Hearings* before the Temporary National Economic Committee of the Seventy-sixth Congress, Third Session.

cated. Many investment firms that have a head office in New York have branches in Chicago, Boston, Philadelphia, San Francisco, and other places, while many firms with head offices in these cities have also a branch in New York City, which has been the undisputed leader in the financial field since long before the War Between the States.

There is concentration of underwriting not only in New York as compared with other cities, but also in a few firms in New York. Of the \$9,200,000,000 in securities issued for cash which were registered with the Securities and Exchange Commission between January, 1934, and July, 1939, 57 per cent was handled by 6 firms in New York City, and another 21 per cent by 14 other firms in that city, making a total of 78 per cent, or more than three-quarters, in New York. Of the remaining issues, 12 per cent was accounted for by the 18 largest firms outside New York City, and the other 10 per cent was divided among all the other firms in the country. Morgan Stanley & Company was the largest single participant in the market during those years, accounting for nearly one-fourth of all registered cash issues.

In general, the higher the quality of the security issued, the larger the proportion handled by New York firms. The large and strong firms in New York have the pick of the market, and the smaller firms outside New York take the offerings that are left. This situation prevails also with regard to the management of issues; Morgan Stanley, for example, managed four-fifths of the registered bonds of the 38 leading borrowers in that period, and no issue of these leading borrowers was managed by an underwriter outside New York.

Sources of Capital Funds

Foreign investors

The sources that are drawn upon by the investment bankers in the process of providing industry and Government with needed funds are various and widely scattered. In the years before 1900, foreign investors provided a large part of such funds, although the proportion was declining steadily throughout the period. Before the War Between the States, canals and railroads had often been built with foreign capital, and by 1860 the Secretary of the Treasury estimated that \$400,000,000 worth of American securities was held abroad. The outbreak of the war was a rude shock to these investors. Many of them sold their American securities, and nearly all of them refused to buy more. It was for this reason that the financing of the war became a domestic problem that gave Jay Cooke his unique opportunity.

As soon as it became apparent from the course of the war that the Northern Government would be the victor, however, European investors recovered their confidence and began to buy Federal and other issues in

large amounts. By 1869 a Congressional committee estimated that Europeans were holding \$1,000,000,000 in United States Government bonds, \$243,000,000 in railroad stocks and bonds, and \$223,000,000 in municipal, mining, canal, and other securities, making a total of \$1,466,000,000. Some of the Government bonds had been bought from American investors who had taken them during the war, and this purchase freed American funds for investment in railroad and industrial issues. But many railroad stocks and bonds were also bought directly by foreigners, some of the bonds being issued in denominations of the English pound rather than the dollar and made payable in London, in order to facilitate English investment. Several of the roads built at this time were practically owned in England, and others were controlled by foreign stockholders who owned a majority of the stock. It was not until the period of railroad mergers around 1900 that railroad securities were bought back by American investors in large amounts.⁵

Industrial securities were never as popular with European investors as the rails and the governments. One reason for this was that a large proportion of industrial issues was in the form of common stock of uncertain earning power, rather than in bonds with a fixed rate of interest. This fact made industrials seem rather speculative to far-off investors whose chief concern was the income to be derived from placements. Moreover, the bankers refused to accept industrial securities on the same terms as rails, as security for loans. Federal issues were the safest of all and were preferred by conservative investors.

The total volume of foreign holdings of United States issues continued to increase until the outbreak of the First World War in 1914, but at a decreasing rate. The total was estimated at \$3,000,000,000 in 1890, had risen to only \$3,300,000,000 by 1899, and by 1914 stood at \$4,500,000,000. These figures must be judged in the light of the rapidly expanding population of these years and the rapidly expanding industry. The United States was becoming self-sufficient with respect to its own capital needs, and indeed was soon to reach the point of providing capital funds for other nations.

Domestic investors

The investing public in the United States was becoming increasingly interested in stocks and bonds in the years just before the First World War. Whereas formerly there had been a tendency for the small investor to hold real estate or a real estate mortgage and leave securities for the large investors and speculators, it now became customary for securities to be held, widely scattered, among a great number of holders, some of whom might own only one or two shares. Some corporations, especially the public utilities, which were desirous of cultivating favor-

⁵ M. G. Myers, *The New York Money Market*; "Origins and Development to 1913." New York: Columbia University Press, 1931.

able public relations, encouraged this development and even made public boast of the number of their shareholders. The American Telephone and Telegraph Company, for example, in 1925 had about 350,000 owners of its approximately 9,000,000 outstanding shares.

This tendency for individuals to invest directly in securities was furthered by the Liberty and Victory Loan campaigns of the war. During the boom of the 1920's, many of these small investors became speculators. The crash of 1929 did not put an end to "odd-lot" purchases by small investors; it merely made them more cautious in their selection and created a preference for the seasoned common stocks, the more conservative preferred stocks, and bonds.

An interesting new feature in the investment activity of the small investor was the rise of the investment trust. This type of corporation, which had developed in England during the last third of the nineteenth century, did not become popular in the United States until after the First World War. The favored form in this country was the management trust, which issued its own stock to investors and placed the proceeds in all kinds of securities at the discretion of the trust managers; in this way the owner of a share of an investment trust stock spread his risk by owning a cross section of many different kinds of issues. Unfortunately, the investment trusts, like the rest of the securities market, became involved in the hysteria of the boom period, and many of them did not survive the crash. But the more conservatively managed were able to survive the depression years and become a permanent addition to investment facilities.

Institutional investors

Although there has been an increasing tendency for individuals to select their own securities for investment, even when their funds are limited, there have always been many who prefer to make their savings in the form of deposits in specialized banks or in the form of insurance policies. These savings banks, insurance companies, and also charitable and religious foundations comprise an important part of the demand for securities.

The insurance companies are the heaviest investors of this group. In 1940 it was reported to the Temporary National Economic Committee that 49 of the legal-reserve life insurance companies, representing more than nine-tenths of all such companies, had assets of over \$26,000,000,000. In conformity with the state laws that regulate the investment of these assets, the insurance companies had about one-fifth of the total in mortgages, another fifth in United States Government bonds, two-fifths in municipal, railroad, public utility, and other bonds and stocks, and the remaining fifth in policy loans, real estate, cash, and miscellaneous items. One of the largest companies has been at times obliged to seek investment for \$1,000,000 daily.

It is clear that the great volume of funds at their disposal gives the insurance companies an enormous power in the investment market. It was formerly the custom for the insurance companies to make their purchases of securities through the investment banking houses, but in recent years, and especially since the legislation of 1933, it has become common for the insurance companies to buy directly from the borrowing corporations, even bidding against the investment bankers in some cases. In October, 1941, for example, the American Telephone and Telegraph Company asked for competitive bids on its \$90,000,000 offering of debenture bonds. Two groups of banking houses entered bids, but saw the prize carried away by a group of insurance companies that had been able to outbid them. In some cases the investment bankers do not even have an opportunity to make a bid. A factor in this development has undoubtedly been the strict regulation to which new offerings in the market are subjected by the Securities and Exchange Commission, but the great financial strength of the insurance companies would undoubtedly have led to such a situation in any case.

Next to the insurance companies, the savings banks form the largest group of institutional buyers of securities. Both savings banks organized as such and trust companies or trust departments of commercial banks are important factors in the market, although they are limited by law to the purchase of the more conservative types of issues. The mutual savings banks had deposits of \$10,000,000,000 in 1940, about half of which was invested in Government and corporate securities, mostly bonds. Other savings deposits are not reported in satisfactory form, but the time deposits of commercial banks, a large part of which are savings deposits, amounted to nearly \$15,000,000,000 in 1940, providing another large volume of funds for investment.

Trust companies, which are not to be confused with investment trusts, were organized originally to make investments for individuals or organizations that did not want to make their own, but they have tended to become more like commercial banks. At the same time commercial banks have taken on trust functions in addition to their other activities. As a result, both groups of banks are important buyers of bonds, especially Government bonds and Government-guaranteed bonds.

In a discussion of corporate investors as a source of capital funds, it should also be mentioned that many corporations provide part or all of their needed funds out of their own profits without going to the investment market at all. The large automobile manufacturers, for example, have increased their capital very largely by plowing back their own earnings into the business. By means of stock dividends, the original investors have found their holdings greatly increased, although they have done no conscious saving or investing.

Capital Funds for Small Business

The stocks and bonds that are underwritten by investment bankers and bought in the market by individuals and institutions, although comprising the most conspicuous part of the investment market, are not by any means the whole market, and are outnumbered although not outvalued by the small issues that never appear in the central money market. Small corporations would find it expensive to raise their capital funds through the specialized investment banking houses of the financial centers, and the bankers themselves would find it not worth their while to handle such small issues, even under the relaxation of Federal regulation that now applies to issues of less than \$100,000.

Moreover, although the corporate form of organization is used by nearly all large and many small business enterprises, the partnership and individual enterprise forms are still used by an enormous number of small concerns, especially in the retail and service lines. These concerns are shut out of the financial markets by their form of organization as well as by their small size. They need relatively small amounts of capital funds, but the obtaining of even that small amount is often a serious matter. Indeed, this has been a serious problem ever since the country was first settled and has not yet been satisfactorily solved. Since the great financial markets cannot help him, the small businessman is thrown back upon local resources, and finds only too often that the very localities in which there is the greatest opportunity for small industry is the very one in which local savings are inadequate to finance him.

Commercial banks are often criticized for their unwillingness to aid local borrowers. In general, the history of bank failures seems to indicate that commercial banks have erred on the side of too great leniency in providing the small businessman with capital rather than on the side of too little. It is no solution of the problem to foist it upon institutions unfitted to handle it, especially since several types of banks that meet this need have been developed.

Savings banks and building and loan associations have become a source of capital funds for some types of small business. In most states, the loans of mutual savings banks are restricted by law to the more conservative forms of highly rated bonds and mortgages, but many small borrowers are able to give mortgage security, which makes them eligible. The banking legislation of 1933-1935 integrated the savings banks into the banking system of the country by granting them the privilege of membership in the Federal Reserve System and the Home Loan Bank system, thus broadening the base of their activities.

The building and loan associations, like the savings banks, accept

small sums from many individual savers and make them available in larger amounts to borrowers. These associations were organized to meet the need for loans on mortgages to homeowners, but they serve also the small business that can borrow in that form. Their usefulness has fluctuated widely from one period to another; they were very active during the real estate boom of the 1890's, the early 1900's, and the 1920's, but less important in the intervening years.

The combined facilities of banks and building and loan associations are still inadequate to meet the genuine need of the small business for capital funds. Because of the failure of private enterprise to solve the problem, the Federal Government has made several attempts to help, either by the creation of new institutions or by making available the existing institutions created originally for another purpose. In the first category are the various agricultural credit banks and mortgage credit institutions that have been of great service to farmers and small homeowners but to few businessmen. In the second category falls such legislation as the permission granted to Federal Reserve Banks after 1932 to lend directly to businessmen if the latter could give evidence of sound credit and inability to borrow elsewhere. Many applications for credit were made to the Reserve Banks under this legislation, but very few loans were made and it became evident that the inability of many of the applicants to borrow elsewhere had been due to their poor credit standing rather than to the inadequacy of financial institutions.

The Securities and Exchange Commission

In addition to the control over the investment market that was embodied in the banking legislation of 1933 and 1935, a new system of direct control was established by the Securities Act of 1933, the Securities and Exchange Act of 1934, and the Public Utility Holding Company Act of 1935. This legislation did not follow the model of any state laws, but turned rather to the English Companies Act, in operation since 1900, which was based on the principle that adequate publicity for all pertinent facts is the most important element in protecting the investor. The Securities Act of 1933 put into effect somewhat more drastic penalties on a somewhat wider group of responsible individuals than did the English law, and entrusted the administration of the Act to the Federal Trade Commission.

After a great deal of criticism and discussion, the Act was amended in the Securities and Exchange Act of 1934. The penalties were made less drastic and less widely applicable, and a special Securities and Exchange Commission was created to administer the law. Under the amended Act new issues of most business corporations except railroads, banks, and a few others must be registered with the Commission before they can be offered to the public. Although at first there was great dislike and suspicion of the Commission and little effort to co-operate,

the financial community soon realized that some form of regulation was inevitable and that it was to their own interest to work with the Commission. Much of its activity has taken the form of regulations and rulings regarding the handling of specific issues. Problems connected with war financing, accounting practice, uniform reporting by corporations, and the like, have been attacked by joint committees of the industry and the Commission to the advantage of both.

The volume of new issues, which reached its low point in the depression years 1932 and 1933, has never regained its former levels. The earlier tendency to blame this situation upon the restrictions of the Securities and Exchange Commission finally gave way to a realization that the whole economic situation had changed and that the good old days of the investment market were probably gone forever. The ability of many large corporations to finance themselves out of their own profits or by private placements of their issues with insurance companies and other large buyers has eliminated a large part of the demand for the services of investment bankers. The real need for their services arises among the smaller business enterprises, which have always had difficulty in providing themselves with capital and which have never been welcome in the large financial centers. The role of the investment banker in the industrialization of the American economy was an important one, but changing conditions require a new type of service if the savings of the future are to be put at the disposal of the industries that promise most for the production of socially useful commodities.

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CHAPTER 29

American Public Finance, 1789-1943

1789-1859

Federal finances

GOVERNMENT in the United States has been greatly influenced by the economic development of the country. In Colonial days the country was undeveloped economically, and, furthermore, the atmosphere of that era was not receptive to a large degree of government. Consequently Governmental expenditures in the Colonies were small. The support of the governor was the occasion for the largest expenditure. The expenses of the militia, which were sometimes met by the individual members, were not great, and no navy was maintained. There were no costly public improvements and no expenditures for welfare purposes, unless the expenditures for ministers of the Gospel and for churches in New England should be so regarded. Families looked after their own poor or insane relatives instead of sending them to a public institution. Nor was education generally considered a public function, although some expenditures were made for schools in New England.

The Colonies paid for their few expenditures in various ways. The New England Colonies levied a poll tax and a tax on the gross produce of land, a contribution that finally developed into a general property tax. A faculty tax, or a tax on individuals according to the assumed incomes from their occupations, was added later. In the South, where there were many large estates, the property tax was not so well received. In the beginning the poll tax had been the chief source of revenue there, but with the importation of slaves it lost favor, and indirect taxes became the main source of revenue. Indirect taxes or excises were also the mainstay of revenue in the Middle Colonies, where the traders were influenced by their Dutch background. Customs duties and excises were used by nearly all of the Colonies to some extent, but there was an early decline in the use of export duties, and only four Colonies retained them after 1750. A large amount of revenue was also derived from issues of paper money.

The situation that gave rise to the Revolutionary War necessitated a more centralized form of government. The Continental Congress, which represented the first step toward the development of a national

government, had little power to raise revenue. It was not empowered to levy taxes, and consequently obtained its funds from the issue of paper money and from borrowing at home and abroad.¹ The Articles of Confederation gave the Government no new powers for raising money. The sale of land in the Northwest Territory proved disappointing as a source of revenue, and aside from a small amount of contributions by the states, the Government continued to finance itself by borrowing. Thus, when the new Federal Government was established in 1789, experience had proved that such a government could not function satisfactorily unless it was made financially independent of the states. Fear of a strong central government was still so great, however, that the powers given the new government were carefully defined and circumscribed in the Constitution. Congress was authorized "to lay and collect taxes, duties, imposts, and excises to pay the debts and provide for the common defense and general welfare of the United States." There were to be no taxes on exports, and direct taxes were to be levied in proportion to population. Furthermore, all taxes were to be uniform throughout the United States—a provision that has been interpreted to mean geographical uniformity. The Federal Government was given power to borrow and to coin money. The Constitution also laid some restrictions upon the states, prohibiting them from levying import or export duties, or from imposing tonnage taxes without the consent of Congress.² In the years since the adoption of the Constitution, the power to tax has been further defined by court decisions. The Federal and state governments have been forbidden to tax each other's instrumentalities, and the states have been prohibited from taxing interstate commerce.³

¹ Although the Continental Congress had no authority for doing so, it stipulated that the currency issues should be repaid in four years by the states, the amount being divided among the states according to their population. The Congress had no power, however, to enforce payment of these sums, and most of them were never paid.

² An exception to the prohibition against the levying of import and export duties by states is made in the case of duties absolutely necessary for the enforcement of inspection laws.

³ The "due process" clause of the Fifth and Fourteenth Amendments has been held applicable to taxation. The Constitution contains other restrictions that apply indirectly to the taxing power of the states. State legislation cannot contravene Federal treaties or impair obligations of contracts. The citizens of each state are entitled to the privileges and immunities of citizens in the several states, and no state is to "deny to any person within its jurisdiction the equal protection of its laws." The states have always been allowed to levy certain taxes on national banks. There has been some change, however, in the Supreme Court's position on the taxation of Federal and state instrumentalities. In 1938 the Supreme Court affirmed the right of the Federal Government to tax salaries paid by the Port of New York Authority, and a year later it approved Federal taxation of state and local salaries. The way was thus cleared for Congress to pass in 1939 the Public Salary Tax Act, which permitted the Federal Government to tax salaries of state employees and states to tax salaries of Federal employees. At the present time there is a great deal of discussion as to whether the Supreme Court would not approve Federal taxation of the interest on state and local bonds and state taxation of the interest on Federal bonds.

According to present-day standards, the expenditures of the Federal Government were small. As a matter of fact, they did not even include the functions that Adam Smith, the great exponent of *laissez-faire*, had held to be the province of government—protection, justice, and public works for facilitating commerce and for education. The appropriation bill of 1789 was a brief document, some 13 lines in length, and included only four items. These pertained to civil expenses, military expenses, the payment of the public debt, and pensions. The largest item of expenditure for the new government was protection. The Whiskey Rebellion of 1794, the skirmishes with the Indians in the Northwest Territory, and the possibility of conflict with France and Spain emphasized the need for an adequate army and navy. Liberal expenditures were made for this purpose until the period of retrenchment under Gallatin in the first decade of the nineteenth century. But the War of 1812 and the Mexican War, as well as the general expansion of the country, necessitated larger expenditures for protection.⁴ Increased expenditures for pensions were a natural outgrowth of the various military conflicts. Payments of interest on the Federal debt were second in size to military expenditures, inasmuch as civil expenditures were a relatively small part of the total. Some internal improvements were undertaken after the War of 1812. Although Jefferson had declared that surplus revenue might well be applied to internal improvements or to education, he doubted the existence of any Constitutional authorization for Federal undertakings of such a nature. Madison was likewise favorably disposed toward the making of internal improvements, but vetoed legislation for such purposes in 1817. Like Jefferson, he did not believe that the Constitution gave the Federal Government authority for such undertakings. At the same time, he suggested a Constitutional amendment granting power to the Federal Government to engage in such activities. Monroe shared Madison's attitude.⁵ As for Jackson, he had voted for internal improvement bills as a Senator; but by the time he became President, he had come to feel that internal improvements should be undertaken not by the Federal Government, but by the states.⁶ Consequently, expenditures for internal improvements were small.

⁴ The Treasury had much less difficulty borrowing during the Mexican War than during the War of 1812, but this fact "was due not so much to a wiser intelligence as to the great increase in the wealth of the country and to the advance in government credit." D. R. Dewey, *Financial History of the United States*, 11th ed., p. 255. New York: Longmans, Green & Company, 1931.

⁵ "Monroe likewise, though friendly to federal aid, was troubled by constitutional scruples, and in 1822 vetoed a bill appropriating money for the erection of toll-gates upon the Cumberland Road; this opposition, however, did not extend to appropriations for the repair of this road, or even to grants of aid to enterprises which were initiated under state authority." Dewey, *Financial History of the United States*, p. 214.

⁶ The explanations for the change in Jackson's views are various. Dewey says that the change in Jackson's political convictions "was due to a sincere belief that

The depression that followed the crisis of 1837, as well as those which followed later crises of the nineteenth century, was not the occasion for large expenditures by the Government for relief. Van Buren did not believe that the Government should assume responsibility for the misfortunes of the people, nor did he believe that the Constitution gave the Federal Government authority to extend aid to industry and to the unemployed.⁷ A similar attitude was taken by Grant in 1873 and by Cleveland in 1893. It must be recognized that the difference in circumstances is partly responsible for the contrast between the attitude of the nineteenth century and that of the present day. The country was more rural at that time, and there were not so many industrial workers wholly dependent upon their jobs for an existence. The fact that there was still a geographical frontier did much to prevent the rise of a serious unemployment problem.

The Federal Government obtained practically all its revenue from customs duties until the time of the War Between the States.⁸ The need for additional funds during the first decade of the new government led to the imposition of internal taxes, to which there was great opposition. The excise tax imposed on whiskey in 1791 resulted in the Whiskey Rebellion in Pennsylvania in 1794. The insurrection was put down, but the excise was not productive. As the need for revenue continued to grow, additional excises were imposed in 1794 on carriages, snuff, refined sugar, and auction sales. In 1797 stamp taxes were imposed on legal transactions, including a tax on legacies and probates of wills. The latter was the first Federal tax on inheritances. The following year a direct tax was imposed for the first time. A tax of \$2,000,000 was apportioned among the states on the basis of population. Collections of this tax

democratic government was threatened by great moneyed interests rather than to fine-spun interpretations of the Constitution." *Ibid.*, p. 215. Jackson's votes as a Senator for internal improvements were undoubtedly influenced by the fact that he had recently returned from frontier campaigns, which had impressed him with the importance of roads from a military point of view. See James Marquis, *Andrew Jackson*, p. 220. (New York: Bobbs-Merrill Company, 1937.) His opposition as President to internal improvements may well have been due in part to the fact that Clay favored them. See P. W. Gates, "Internal Improvements," *Dictionary of American History*, Vol. III. In fact, the Maysville Road, provided for in the bill that Jackson vetoed in 1830, was to have been located in the state in which Clay lived, and "was supposed to be a kind of challenge from that gentleman. . . ." See John S. Bassett, *The Life of Andrew Jackson*, Vol. II, p. 486. (New York: Doubleday, Page and Company, 1911.) "Jackson based his veto partly on constitutional grounds." See William MacDonald, *Jacksonian Democracy*, p. 140. (New York: Harper and Brothers, 1906.) He reconciled his veto with his earlier votes for internal improvements by stressing the local character of the project. See Bassett, p. 491.

⁷ Sidney Ratner, *American Taxation*, p. 41. New York: W. W. Norton and Company, 1942.

⁸ The need for revenue, however, was not the sole reason for levying customs duties. Even the first tariff "was protective in intention and spirit." F. W. Taussig, *The Tariff History of the United States*, 8th ed., p. 14. New York: G. P. Putnam's Sons, 1931.

TABLE 1
FEDERAL EXPENDITURES AND REVENUES, 1789-1859¹
(In millions of dollars)

EXPENDITURES					
	<i>Civil</i>	<i>Army and Navy</i>	<i>Pensions</i>	<i>Interest</i>	<i>Total</i>
1789-91.....	1.1	.6	2	2.3	4.3
1792.....	.7	1.1	.1	3.2	5.1
1795.....	1.5	2.9	*	3.2	7.5
1800.....	1.4	6.0	*	3.4	10.8
1805.....	4.0	2.3	*	4.1	10.5
1810.....	1.4	3.9	*	2.9	8.2
1812.....	2.1	15.8	*	2.5	20.3
1813.....	2.0	26.1	*	3.6	31.7
1814.....	2.5	27.7	*	4.6	34.7
1815.....	3.5	23.5	*	5.8	32.7
1820.....	2.9	7.0	3.2	5.1	18.3
1830.....	3.9	8.0	1.4	1.9	15.1
1835.....	5.9	9.6	2.0	*	17.6
1836.....	10.0	18.0	2.9		30.9
1837.....	14.2	20.3	2.7		37.2
1840.....	8.3	13.2	2.6	.2	24.3
1850.....	16.7	17.3	1.9	3.8	39.5
1859.....	27.3	37.9	1.2	2.6	69.0

REVENUE				
	<i>Customs</i>	<i>Internal Revenue</i>	<i>Misc.</i>	<i>Total</i>
1789-91.....	4.4		*	4.4
1792.....	3.4	.2	*	3.7
1795.....	5.6	.3	.2	6.1
1800.....	9.1	.8	.1	10.8
1805.....	12.9	*	.7	13.6
1810.....	8.6	*	.8	9.4
1812.....	9.0	*	.8	9.8
1813.....	13.2	*	1.1	14.3
1814.....	6.0	1.7	3.5	11.2
1815.....	7.3	4.7	3.8	15.7
1820.....	15.0	.1	1.8	17.9
1830.....	21.9	*	2.9	24.8
1835.....	19.4	*	16.0†	35.4
1836.....	23.4		27.4†	50.8
1837.....	11.2	*	13.8†	25.0
1840.....	13.5	*	6.0†	19.5
1850.....	39.7		3.9	43.6
1859.....	49.6		3.9	53.5

¹ Secretary of the Treasury, *Annual Report*. Because of rounding of figures, totals will not check in all cases.

* Less than \$100,000.

† Sales of public land were unusually large in these years.

were poor, and three years later 60 per cent of the tax was still unpaid. With the beginning of Jefferson's administration, there was a reduction of taxation. All excises were abolished in 1802 except the salt tax, which was repealed in 1807. The War of 1812, however, necessitated the levying of internal taxes again. Direct taxes were also imposed, and

met with greater success than those of 1798. Of the total assessment of \$12,000,000, more than \$10,000,000 was collected. In spite of the fact that additional taxes were levied, about 90 per cent of the cost of the war was met by borrowing. After the War of 1812 these taxes were repealed, and Federal revenue was derived from customs duties and from sales of public land until the time of the War Between the States.

When the Federal Government was established in 1789, it assumed the Continental and the Confederation debts and the state debts, which had been incurred in the fighting of the Revolution.⁹ Considerable progress was made in paying off these obligations during the conservative administration of Jefferson and Gallatin, but the War of 1812 added greatly to the debt. In succeeding years, however, surpluses were embarrassingly large. By 1826 it had already become apparent that there would soon be a surplus in the Treasury. Between 1834 and 1836 Federal revenue more than doubled as a result of the increase in customs duties and the sales of public lands, with the result that the Federal debt was paid off before 1836. Jackson opposed the expenditure of surplus revenue on internal improvements, because, as already noted, he believed that such matters were not within the province of the Federal Government. Outright gifts to the states were opposed on the ground that they lacked a constitutional basis. A bill was finally passed providing that the surplus should be deposited with the states according to their representation in Congress. Although these deposits were made in the form of loans, it was understood that they would never be called for, and that they were really gifts. These deposits, however, are still carried on the books of the United States Treasury.¹⁰ This solution to the problem was a compromise and did not give complete satisfaction. The Whigs favored an outright distribution, while some of the Southern states, which were very much opposed to the protective tariff, "received their share with protests and received them only because if they refused the North would get them. . . ." ¹¹ The distribution was to be made in four installments, only three of which were made before the crisis of 1837. The fourth installment was never paid.¹²

⁹ There was considerable opposition to the assumption of state debts. At about the same time there was also a great deal of discussion as to the location of the national capital. The story goes that Hamilton and Jefferson settled these questions one evening after dinner "over the walnuts and wine," Hamilton securing Jefferson's support for the assumption of state debts in exchange for the locating of the national capital in the South. See T. J. Grayson, *Leaders and Periods of American Finance*, Chapter IV. New York: John Wiley and Sons, Inc., 1932.

¹⁰ B. U. Ratchford, *American State Debts*, p. 85, footnote 22. Durham, N. C.: Duke University Press, 1941. "... within recent years Comptroller McCarl, in reporting on the claims of certain states against the United States, has made reference to them as a factor which might be used to offset the state's claims."

¹¹ E. G. Bourne, *The Surplus Revenue of 1837*, p. 25. New York: G. P. Putnam's Sons, 1885.

¹² "The uses made of the funds distributed were various. Massachusetts distributed them among the towns: Boston used the money for current expenses; Salem

In the depression that followed the crisis of 1837, the Government found itself in a difficult financial position. Revenue declined, but expenditures for lighthouses, custom-houses, branch mints, and new roads to the territories remained large, while the expenses of civil administration increased. But with the raising of tariff duties in 1842 and the return of prosperity shortly thereafter, the position of the Government improved. The country remained very prosperous until the crisis of 1857. Customs duties and sales of public lands were so large that frequent surpluses resulted. The national debt, which had increased from \$15,500,000 in 1846 to over \$68,000,000 in 1851, had been reduced by 1857 to \$28,700,000. The frequent occurrence of large surpluses resulted in a lowering of tariff duties in 1857. Unfortunately, the reduction of the tariff coincided with a serious financial and industrial crisis. Revenue declined and in 1858 the Government entered upon a period of deficits that was to last for eight years.

State and local finances

During the years from the formation of the Union until the War of 1812 the states had no serious financial problems. For their Revolutionary debts, most of the states received Federal bonds, which they set aside as capital funds, invested in bank stock, or used for current expenditures. The sale of public lands also provided the states with revenue, some of which was treated as a capital fund, but most of which was used currently. The ease with which revenue was obtained encouraged the states to spend liberally on their judiciaries, militias, and fortifications, without any great need for taxation.

As a result of the direct tax requisitions during the War of 1812, many states incurred deficits. But reimbursement by the Federal Government for war expenditures and the prosperity that followed 1820 eliminated any financial worries of the states. The construction of the Erie Canal in New York, completed in 1825, proved to be a very profitable venture, contrary to popular expectation. From that time until shortly after the crisis of 1837 the states indulged in an orgy of improvements. The construction of highways, canals, and railroads and the improvement of rivers were undertaken on a large scale. Many states, especially those in the South, invested in bank stock. The distribution of the surplus in the Federal Treasury in 1837 encouraged the states in their liberal spending. It is not surprising, therefore, that the depression that followed the crisis of 1837 found the states in such poor financial condition. Many of the projects undertaken proved unprofitable. Nine states de-

built a town hall; Groton repaired a broken bridge. The State of Maine made a per capita distribution; some States used the money for internal improvements, while a few saved it and use its income today for educational and other purposes." Dewey, *Financial History of the United States*, p. 222.

faulted.¹³ A movement began for the Federal assumption of state debts, based on the theory that the internal improvements for which the debts were incurred were of benefit to the whole country. This movement became an issue in the election of 1842, but nothing came of it. Although there was a general economic recovery in the 1840's and states increased their tax rates, the unhappy period of defaults resulted in constitutional limitations on state borrowing. Such limitations had been unknown before 1840; but by 1855, 19 states had added to their constitutions amendments imposing such limitations. The states engaged in considerable borrowing again in the 1850's. With the exception of New York, this borrowing, which was principally for railroads, was undertaken by Southern and Western states, none of the states that defaulted in the 1840's participating. The borrowing of the 1850's was not quite so reckless and speculative as in the earlier period, but resulted, nevertheless, in large losses.

As the states expanded their activities during the 1820's and 1830's, taxation became more necessary, although there was still a tendency to look upon investments as a primary source of revenue and on taxation as merely a supplementary source. The general property tax was the principal source of state revenue. An effort was already being made in these years to meet some of the problems incident to the general property tax through the creation of county and state boards of equalization. Some revenue was also derived from faculty taxes or income taxes. The early faculty taxes differed from modern income taxes primarily in the fact that they were a tax on assumed and not on actual income. They were an attempt to make taxation more equitable by recognizing that income is a better guide to taxpaying ability than property. Pennsylvania and Maryland levied income taxes in the 1850's largely because of the need for more revenue. In some of the Southern states, however, in Virginia, Alabama, Florida, and North Carolina, such taxes were to be accounted for in a larger measure by a movement for greater equality in taxation.¹⁴ Taxes were also levied on various kinds of businesses. Virginia imposed a tax on railroads and public service corporations in 1842, and in 1844 Pennsylvania levied a capital stock tax on all corporations. A number of states also made use of in-

¹³ Dewey, *Financial History of the United States*, pp. 244-245. "... and in some of the newer commonwealths particularly there was not an honest determination, even where there was the ability, to meet the maturing obligations of interest and principal." Also see Ratchford, *American State Debts*, p. 87. "... the New England states, North Carolina, and Georgia did not participate in the borrowing of this period."

¹⁴ Land taxes had never been so important in the South as in the North because of the influence of large landowners. But gradually there appeared in society a new group made up of merchants and professional people. An income tax was one means of forcing this new group to help meet the expense of government. License taxes on occupations were another means used to put part of the burden on this new group.

heritance taxes at an early date. Pennsylvania levied the first inheritance tax in 1826, and Louisiana the second one in 1828. Virginia had had a probate duty ever since 1687. North Carolina imposed an inheritance tax on collateral heirs in 1847 and taxed direct heirs in 1855 for the first time in American history. The inheritance tax was used to a greater extent in the South than in the North. In fact, five of the seven states with inheritance taxes were in the South.¹⁵

1860-1913

Federal finances

In 1861 war broke out. The seriousness of the conflict was not appreciated in the beginning, and it was generally believed that the war would soon be over. But the struggle lasted four years and left enduring marks on the economic, political, and social life of the country.

The expenditures of the Federal Government increased sevenfold in 1862, and by 1865 were about 20 times as large as they had been in 1860. In spite of an increase in civil expenditures, total expenditures declined rapidly after the war was over, because of the decrease in military expenditures and in interest payments on the Federal debt. Expenditures remained relatively stable from the late 1860's until the 1890's. The decline in interest payments on the public debt compensated for the considerable expansion in pensions in the 1880's. With the beginning of Harrison's administration, larger appropriations were made for rivers and harbors and for the navy, and pensions were further increased. The brief Spanish-American War in 1898 necessitated an increase in expenditures. The decrease in expenditures after the war was of short duration, and with the twentieth century a great expansion began. Appropriations for the army and navy were increased, and pensions continued to expand. The building of the Panama Canal involved large outlays. The expenses of civil administration grew as the Government entered upon new activities, and as the increased cost of living required a higher level of salaries.¹⁶ The construction of public buildings, the expansion of the work of some agencies and bureaus, such as the Interstate Commerce Commission and the Census Bureau, and the creation of new departments, such as Commerce and Labor, all contributed to a larger total.

Before the War Between the States the Federal Government had obtained practically all its revenue from customs duties. The Secretary of the Treasury, Chase, believing that the war would not last long, planned to finance it mainly by borrowing, although he hoped to obtain some revenue from increases in the tariff, sales of public lands, and direct

¹⁵ Ratner, *American Taxation*, p. 51. New York: W. W. Norton and Company, 1942. "The receptivity of the southern planter aristocracy to advanced ideas in taxation has not received the attention it deserves."

¹⁶ Some of these new activities were food and meat inspection, the reclaiming of arid lands, and the extension of forest service.

TABLE 2
FEDERAL EXPENDITURES AND REVENUE, 1860-1913¹
(In millions of dollars)

EXPENDITURES					
	<i>Civil</i>	<i>Army and Navy</i>	<i>Interest</i>	<i>Pensions</i>	<i>Total</i>
1860.....	30.9	27.9	3.2	1.1	63.1
1861.....	26.1	35.4	4.0	1.0	66.5
1862.....	23.6	437.0	13.2	.9	474.8
1863.....	26.4	662.5	24.7	1.1	714.7
1864.....	30.1	776.5	53.7	5.0	865.3
1865.....	49.9	1,153.9	77.4	16.3	1,297.6
1866.....	44.4	327.8	133.1	15.6	520.8
1870.....	72.7	79.4	129.2	28.3	309.7
1880.....	63.4	51.7	95.8	56.8	267.6
1890.....	108.5	66.6	36.1	106.9	318.0
1895.....	103.2	80.6	31.0	141.4	356.2
1898.....	107.5	150.8	37.6	147.5	443.4
1899.....	132.0	293.8	39.9	139.4	605.1
1900.....	149.1	190.7	40.2	140.9	520.9
1901.....	147.9	205.1	32.3	139.3	524.6
1902.....	137.6	180.1	29.1	138.5	485.2
1910.....	198.6	313.0	21.3	160.7	693.6
1913.....	191.1	335.4	22.9	175.1	724.5

REVENUE				
	<i>Customs</i>	<i>Internal Revenue</i>	<i>Misc.</i>	<i>Total</i>
1860.....	53.2		2.9	56.1
1861.....	39.6		1.9	41.5
1862.....	49.1		2.9	52.0
1863.....	69.1	37.6	6.0	112.7
1864.....	102.3	109.7	52.6	264.6
1865.....	84.9	209.5	39.3	333.7
1866.....	179.0	309.2	69.8	558.0
1870.....	194.5	184.9	31.8	411.3
1880.....	186.5	124.0	23.0	333.5
1890.....	229.7	142.6	30.8	403.1
1895.....	152.2	143.4	29.1	324.7
1898.....	149.6	170.9	84.8	405.3
1899.....	206.1	273.4	36.4	516.0
1900.....	233.2	295.3	38.7	567.2
1901.....	238.6	307.2	41.9	587.7
1902.....	254.4	271.9	36.2	562.5
1910.....	333.7	289.9	51.9	675.5
1913.....	318.9	344.4	60.8	724.1

¹ Secretary of the Treasury, *Annual Report*. Because of rounding of figures, totals will not check in all cases.

TABLE 3
FEDERAL DEBT, 1860-1913¹
(In millions of dollars)

1860.....	65	1890.....	713
1861.....	91	1895.....	718
1862.....	366	1898.....	849
1863.....	708	1899.....	1,047
1864.....	1,360	1900.....	1,025
1865.....	2,220	1901.....	989
1866.....	2,326	1902.....	932
1870.....	2,039	1910.....	915
1880.....	1,718	1913.....	967

¹ Secretary of the Treasury, *Annual Report*.

taxes or internal duties. Customs duties were increased, and a variety of miscellaneous excises were imposed, including taxes on liquor and tobacco.¹⁷ A direct tax of \$20,000,000 was levied on real property in 1861, apportioned among the states according to population. This tax was not very productive, yielding less than \$2,000,000 in 1861 and less than \$1,500,000 the next year. It was suspended in 1864. The public was more than willing—in fact, even anxious—for heavier taxation. To many people a direct tax, or a tax on real estate unaccompanied by a tax on personal property, seemed unjust. Consequently, Congress enacted an income tax in 1861, but Secretary Chase did not favor it, and it was some months before he took steps toward organizing collection machinery.¹⁸ The rates of the income tax were increased in later revenue acts, and the tax proved to be very productive, contributing over one-fifth of the internal revenue between 1863 and 1870. The need for still more revenue led to the passing of an inheritance tax in 1862.

The Government relied for most of its funds, however, on the issue of paper money and on loans rather than on taxes. Beginning with the autumn of 1861, the Government issued non-interest-bearing notes, which were legal tender, to the amount of \$450,000,000. These notes, known as *greenbacks*, underwent a very rapid depreciation. The question of their redemption in specie was one of the great political and economic issues of the next decade. It was finally settled by providing that redemption of specie payments should take place in 1879.

The largest part of the necessary funds, however, was derived from loans. The difficulty encountered in trying to market bonds was one important reason for the establishment of the national banking system, although the new bond-secured currency did not provide a large market for Government bonds. The method of financing the war improved as the struggle wore on. Taxes, which had furnished less than one-eighth as much as loans in 1861, were furnishing almost one-fifth in 1862, and by 1864 were supplying over one-third as much as loans. The result

¹⁷ A tax was levied upon carriages, auction sales, the gross receipts of railroads, steamboats, bridges, and insurance, and upon telegraph, telephone, and express companies, and various other businesses and industries. License taxes were imposed on 33 occupations and professions, and a \$10 license fee was imposed on all unenumerated occupations in 1864.

¹⁸ "The merchant and importing classes were the only business groups which supported the income tax consistently during the eighteen-sixties. They feared that federal reliance on the protective tariff for revenue would entrench the manufacturing interests at their expense. They were also afraid that an increasingly unbalanced budget would lead to further inflation and would drastically curtail imports." Ratner, *American Taxation*, p. 82. New York: W. W. Norton and Company, 1942. The law of 1861 levied a tax of 3 per cent on all income over \$800. No distinction was made between net and gross income, the only deduction allowed being taxes. Income from Government securities was to be taxed at only 1½ per cent, but in revisions of this law the income from Government securities was shown no favoritism. The rates were raised several times, until in 1864 income between \$600 and \$5,000 was taxed at 5 per cent and income over \$5,000 at 10 per cent. Provision was made for collecting this tax at the source.

of extensive borrowing, of course, was a great increase in the Federal debt. From \$65,000,000 in 1860, the debt increased to \$2,324,000,000 in 1866, a figure not to be equalled again until the First World War.

With the return of peace, expenditures declined and taxes were reduced. Internal revenue taxes were gradually repealed in the years from 1866 to 1883, after which only liquor and tobacco were subject to taxation. The income tax was reduced after the war and expired in 1872. The inheritance tax was repealed in 1870.

In spite of the repeal of most of the emergency taxes, the War Between the States was followed by an extended period of surplus revenue. Surpluses were not serious during the 1870's, but they became larger in the 1880's in spite of a moderate increase in expenditures and a further reduction in internal revenue duties in 1882. These surpluses, together with agricultural sentiment for tariff reform, brought some modification of tariff duties in 1872, but the strength of the protectionist interests prevented any substantial lowering of import duties. Although the tariff of 1883 altered the general level of duties little, it tended to be more protective than the preceding one. To use the surpluses to pay the debt was not a happy solution to the problem, because bonds were at a premium. By 1886 the Government had paid off all the debt callable at that time, a large portion of the public debt not being redeemable before 1907. Buying bonds at a premium meant that bondholders were realizing a profit at the expense of taxpayers. Furthermore, the reduction of the debt also had the undesirable result of forcing a contraction in the volume of circulating currency, since it formed the basis for the issue of bank notes. Nevertheless, because there seemed to be practically no alternative, the Treasury used the surpluses to buy a considerable amount of the Federal debt at a premium in the open market. From \$2,324,000,000 in 1866 the debt was reduced to \$1,748,000,000 in 1873. After the crisis of 1873, little progress was made toward reducing the debt until the return of prosperity and the increase in Federal revenue at the end of the decade. The recurrence of large surpluses from that time until the crisis of 1893 resulted in a rapid reduction of the debt, which amounted to only \$587,000,000 in the latter year.

The surpluses became so embarrassing that in 1887 Cleveland devoted his whole message to Congress to the need for tax reform and a reduction of the tariff, declaring, "It is a condition which confronts us, not a theory." The tariff subsequently became the main issue of the election of 1888. The Republicans took Cleveland's defeat to be an endorsement of a high tariff, and raised duties still further in the McKinley tariff of 1890, with a view both to protection and to the reduction of revenue. The decline in customs duties as a result of higher rates and the slump in world trade, the reduction in internal revenue duties in

1890, and the expansion of expenditures under the Harrison administration combined to produce a deficit in 1894, the first one since 1865.

Agitation for an income tax was practically continuous after the expiration in 1872 of the income tax of the War Between the States. From 1874 on, one or more income tax bills were introduced at almost every session of Congress. Most of the support for the tax came from Southern and Western Congressmen. The Greenback party, the Anti-Monopoly party, the Knights of Labor, and the Populist party came out for the measure.¹⁹ The decline in revenue strengthened the fiscal argument for the tax, but the income tax law passed by Congress in 1894 was not the result of fiscal necessity. It was, rather, "really the result of a great equalitarian movement generated by two prolonged postwar depressions of great severity."²⁰ The law was declared unconstitutional by the Supreme Court in 1895, the Court construing the tax as a direct tax. It held that a tax on the income from property was in fact a tax on property, or a direct tax; and, since the Constitution required direct taxes to be apportioned according to population, the law was declared unconstitutional.²¹

Deficits continued for a period of six years after the crisis of 1894, during which time industry and business stagnated. Industry and trade had begun to recover shortly before the Spanish-American War. This war, which was an unimportant incident as compared with the War Between the States, was financed by borrowing and by heavier internal revenue duties, including higher taxes on liquor and tobacco, and a variety of stamp duties and license taxes. For the third time during an emergency, an inheritance tax was imposed.²² With the decrease in expenditures after the war, these taxes were no longer needed, and all were repealed by 1902.

In the first decade and a half of the twentieth century, deficits alternated with surpluses. Prosperity had returned and there was a gradual increase in revenue as well as in expenditures. The Federal debt had been swollen by the deficits of the 1890's and by the expenditures for the Spanish-American War, until by 1899 it was again more than \$1,000,000,000. It changed little with the alternating surpluses and deficits of the next 14 years, amounting to \$967,000,000 in 1913.

There was little agitation for an income tax for more than a decade

¹⁹ Roy G. and C. Gladys Blakey, *The Federal Income Tax*, pp. 9-11. New York: Longmans, Green and Company, 1940. Between 1873 and 1893, 68 different income tax bills were introduced into Congress.

²⁰ Blakey, *The Federal Income Tax*, p. 1. A tax of 2 per cent was levied on personal and corporate income. Gifts and inheritances were included in income. No distinction was made between earned and unearned income.

²¹ The income tax of the War Between the States had not been regarded as a direct tax.

²² The tax applied to personal property, varying from $\frac{3}{4}$ of 1 per cent on direct heirs to 5 per cent on distant relatives and strangers. The rates increased with the size of the estate to a maximum of 15 per cent.

after the Supreme Court declared the law of 1894 unconstitutional. The Democratic Convention put a plank in its platform in 1908 favoring an income tax. Although the Republican party was successful in the election of 1908, it was during Taft's administration that the struggle for an income tax was won.²³ As it became clear that continued opposition on the part of the administration to a personal income tax would result in a split in the Republican party, Taft sent a message to Congress recommending a tax on corporate income and an amendment to the Constitution that would permit the taxation of personal incomes. The corporation tax was considered the lesser of the two evils by the conservatives, and was imposed by Congress in 1909. In order to insure its constitutionality, it was levied as an excise tax on the privilege of doing business. The Democrats and Insurgents, however, were unwilling to give up the idea of a personal income tax, and succeeded in putting a resolution for an amendment through Congress in July, 1909. Conservatives passed the amendment in the belief that it would never be ratified by the necessary number of states. By February, 1913, however, the amendment had been ratified by 36 states, and a tax on personal income was levied later that year.²⁴ These two taxes represent a milestone in the history of American taxation. Like the income tax of 1894, they were not brought about by fiscal necessity but by social and political pressures that became irresistible.

State and local finances

The expenditures of state and local government increased during the period of the War Between the States both because of the offering of bonuses to volunteers and the outfitting of military units, and also because of the effect of the inflated price level on civil expenditures. A large amount of debt was incurred during the war years, since the system of taxation was not capable of expanding to meet the increased expenditures. Interest payments on the larger debt contributed to a higher level of expenditures after the war was over. There was a general tendency toward the reduction of debt until about 1902, when states began to borrow considerable sums for the construction of highways. Municipal expenditures increased very rapidly, and there was much graft. In the post-war era, rabble from the North, known as "carpetbaggers,"

²³ See Blakey, *The Federal Income Tax*, Chapter II, for an account of this struggle.

²⁴ Cordell Hull, who had been one of the most vocal and hard-working advocates of the income tax for some years, made the original draft of the law, and John Nance Garner fought hard for the principle of graduated rates. An exemption of \$3,000 was allowed single persons and one of \$4,000 for married persons. No specific exemptions were allowed for children. The normal rate was 1 per cent and the surtaxes ranged from 1 per cent on income over \$20,000 to 6 per cent on income over \$500,000. The principle of collection at the source was embodied in this law, as it had been in the law of 1862.

and Southern "scalawags" obtained control of government in the South. It was a period marked by great extravagance and corruption, with few benefits to show for the large debts incurred. After the South drove out the carpetbaggers in the early 1870's, there was much repudiation of debt in Louisiana, Georgia, North and South Carolina, Alabama, Virginia, and Arkansas. With the decline in revenue during the years following the crisis of 1873, it was difficult to make payments on the large debts that had been incurred, and many local governments in both the North and South also repudiated their debts.

The rapid increase in expenditures continued into the twentieth century, as did the tendency toward urbanization. The Government took on new functions and developed old ones more intensively. By 1913 state and local expenditures amounted to more than \$2,000,000,000. For some time states had been extending aid to their subdivisions for education; toward the end of this period they began extending aid for various other purposes.

Throughout this whole period the major source of state revenue, and practically the only source of local revenue, was the general property tax. Attention was continually given to improving the administration of this tax. State boards of equalization were set up to supervise the administration of the tax, to equalize assessments, and to provide for state assessment of railroads. Boards of equalization finally gave way to state tax commissions, which were entrusted with all the functions of the old boards and were also given supervision over the new taxes on business. As it became apparent that the defects of the property tax were inherent in the tax itself and were not merely of an administrative character, classified property taxes were substituted in some cases for the general property tax. Rates were no longer uniform on all property, and intangibles were assessed at special low rates. The classified taxes were more equitable and gave less encouragement to evasion than the general property tax. By 1913, 12 states were using some system of classification.²⁵

As for other sources of revenue, taxes on state banks became less important after the establishment of the national banking system. Various kinds of special taxes were imposed on business after the War Between the States. Special taxes were levied on railroads, on the so-called "corporate excess," and on capital stock. New impetus was given to the adoption of state inheritance taxes by the New York law of 1885, which taxed collateral heirs. Seven years later, New York levied a tax on direct heirs, which is often regarded as the first modern direct inheritance tax, since the North Carolina tax of 1855 was abolished in 1874. Progressive rates were generally adopted, and only three states had not

²⁵ Simeon E. Leland, *The Classified Property Tax in the United States*, Chapter IV. Boston: Houghton Mifflin Company, 1928.

levied such a tax by 1913. The most important innovation of the period, however, was the adoption of an income tax by Wisconsin in 1911. Contrary to the opinions of many as to the feasibility of a state income tax, this tax proved very successful.

1914-1932

Federal finances

Although the United States did not enter the First World War until 1917, it was constantly under the shadow of the war from the beginning. Without two laws passed in 1913, one establishing the Federal Reserve System and the other levying an income tax, the successful prosecution of the war would have been much more difficult. The Federal Reserve System was responsible in large part for the marketing of Government loans, and the income tax was one of the mainstays of Federal revenue.

The First World War is estimated to have cost the United States about \$35,000,000,000.²⁶ Since this figure includes loans of \$9,000,000,000 to the Allies, the direct outlays by the United States were approximately \$26,000,000,000. About one-third of the total cost was met by taxes and the remainder by loans. Although it had been hoped at the beginning of the war that one-half of the total cost could be met by taxation, this record was better than that made during the War Between the States.

With the outbreak of war in 1914, it was obvious that there would be a drop in revenue. An emergency revenue measure of that year levied new taxes and increased the rates of old ones. Taxes on liquor were increased, and excises were levied on toilet articles, chewing gum, telephone and telegraph messages, freight and express charges. License taxes were imposed upon certain occupations, and stamp taxes were levied on various commercial transactions.

With the beginning of our active participation in the war in 1917, expenditures increased rapidly. In 1917 they were \$1,978,000,000 as compared with \$734,000,000 in 1916. By 1919 they were more than \$18,500,000,000, a figure not to be equalled again until the Second World War. The need for more revenue was imperative. Three times before during an emergency, an inheritance tax had been levied, and the Revenue Act of 1916 levied such a tax for the fourth time.²⁷ Both personal

²⁶ J. M. Clark, *The Costs of the World War to the American People*, p. 114. New Haven: Yale University Press, 1931. This figure includes outlays to June 30, 1921.

²⁷ An exemption of \$50,000 was allowed resident decedents, and the rates, which began at 1 per cent on the first \$50,000 and extended to 10 per cent on amounts over \$50,000, applied to the whole estate. State opposition to this tax was weakened in 1916 by the great need of the Federal Government for revenue and by the fact that the measure was proposed by the Democratic party, which had always been mindful of state rights. See Roy G. Blakey, "The New Revenue Act," *American Economic Review*, Vol. VI, p. 844, December, 1916.

TABLE 4
FEDERAL EXPENDITURES AND REVENUE, 1914-1932¹
(In millions of dollars)

EXPENDITURES							
	<i>Civil</i>	<i>Army and Navy</i>	<i>Interest</i>	<i>Total</i>			
1914.....	364	348	23	735			
1916.....	374	337	23	734			
1917.....	1,335	618	25	1,978			
1918.....	6,358	6,149	190	12,697			
1919.....	6,884	11,011	619	18,515			
1920.....	3,025	2,358	1,020	6,403			
1921.....	2,348	1,769	999	5,116			
1925.....	1,464	717	882	3,063			
1930.....	1,942	839	659	3,440			
1931.....	2,207	832	612	3,652			
1932.....	3,102	834	599	4,535			

REVENUE							
	<i>Customs</i>	<i>Income</i>	<i>Liquor</i>	<i>Tobacco</i>	<i>Manuf. Excises</i>	<i>Misc.</i>	<i>Total</i>
1914.....	292	71	226	80		65	735
1916.....	213	125	247	88	4	106	783
1917.....	226	360	284	103	*	151	1,124
1918.....	180	2,314	444	156	37	534	3,665
1919.....	184	3,018	483	209	79	1,179	5,152
1920.....	323	3,945	140	296	268	1,723	6,695
1921.....	309	3,206	83	255	229	1,543	5,625
1925.....	548	1,761	26	345	141	959	3,780
1930.....	587	2,411	12	450	3	715	4,178
1931.....	378	1,860	10	444	*	498	3,190
1932.....	328	1,057	9	399	*	93	2,006

¹ Secretary of the Treasury, *Annual Report*. Because of rounding of figures, totals will not check in all cases. Figures for liquor, tobacco, and manufacturers' excises are on the basis of reports of collections; other figures for revenue are on the basis of daily Treasury statements (unrevised).

* Less than \$1,000,000.

TABLE 5
FEDERAL DEBT, 1914-1929¹
(In millions of dollars)

1914.....	969	1920.....	24,068
1915.....	971	1921.....	23,748
1916.....	973	1925.....	20,241
1917.....	2,727	1930.....	15,954
1918.....	12,006	1931.....	16,571
1919.....	25,246	1932.....	19,221

¹ Secretary of the Treasury, *Annual Report*.

and corporate income taxes were increased.²⁸ A tax of 12½ per cent on the profits of munitions manufacturers and a capital stock tax were

²⁸ By 1918 the normal rate of the personal income tax was 6 per cent on the first \$4,000 and 12 per cent on income over \$4,000, as compared with a flat 1 per cent in 1913. Surtax rates in 1918 began at 1 per cent on income over \$5,000 and extended to 65 per cent on income over \$1,000,000, as compared with rates in 1913 ranging from 1 per cent on income over \$20,000 to 6 per cent on income over \$500,000. The corporate income tax was 12 per cent in 1918 as compared with 1 per cent in 1913.

levied. A tax of 10 per cent was also levied on admissions and dues. An excess profits tax was imposed in 1917 and altered somewhat in 1918.²⁹ The major emphasis in selecting a base for normal earnings was put on invested capital rather than on pre-war earnings, with the thought that if the tax was successful it could be retained permanently. These measures were a distinct improvement over those taken at the time of the War Between the States. Their progressive nature is indicated by the fact that more than one-half of the estimated revenue under the Revenue Act of 1916 was to come from the income tax, and that the income and excess profits taxes were to provide about three-fourths of the estimated revenue from the Act of 1917 and about four-fifths of the estimated revenue from the Act of 1918.

Taxation could not furnish all the necessary funds, nor could it provide funds quickly enough. Consequently the Government borrowed on a large scale. Beginning with March, 1917, four Liberty Loans were floated. The bonds were sold mainly through the Federal Reserve Banks, which distributed them to their member banks. The latter sold them to the public.³⁰ War savings certificates and war savings stamps were issued to absorb the savings of the lower-income groups.³¹

²⁹ In 1917 a tax with five brackets, graduated from 20 per cent to 60 per cent according to the percentage return on capital, was levied on corporate net income which exceeded \$3,000 plus an amount equal to the same percentage of invested capital as the average income of the years 1911-13 was of the invested capital of those years, but not less than 7 per cent nor more than 9 per cent. Individuals and partnerships were subject to the excess profits tax in 1917 but not in later years. They were allowed a specific exemption of \$6,000. In 1918 the five brackets of the 1917 law were superseded by two brackets with rates of 30 per cent and 65 per cent. A war profits tax was also superimposed on the excess profits tax in 1918. It consisted of a tax of 80 per cent of the amount by which net income in excess of the war-profits credit exceeded the amount of the excess-profits tax. For 1919 the rates of the excess profits tax were reduced to 20 per cent and 40 per cent.

³⁰ The First Liberty Loan was for over \$3,000,000,000, the Second Liberty Loan for almost \$4,000,000,000, the Third for over \$4,000,000,000, and the Fourth for almost \$7,000,000,000. The rate of interest was 3½ per cent on the First, 4 per cent on the Second, and 4¼ on the Third and Fourth Loans. When the war was over, expenditures did not decrease immediately. To meet the need for funds, the Government issued \$3,500,000,000 of notes under the Victory Loan Act. These notes were to mature in five years or less, whereas the previous bond issues were to run for ten years or longer. "Over the protests of leading economists, bankers, and public men" these loans carried tax-exemption privileges. (W. J. Shultz and M. R. Caine, *Financial Development of the United States*, p. 534. New York: Prentice-Hall, Inc., 1937.) The First Liberty Loan was granted the privilege of tax exemption and also the privilege of convertibility into later issues. The Second Liberty Loan was not exempted from federal inheritance taxes, income surtaxes, or the excess profits tax. The Third Liberty Loan was allowed no tax exemption at the time of issue. Interest on \$30,000 of the bonds of the Fourth Liberty Loan was exempted from surtaxes and the excess profits tax until two years after the close of the war. The purchase of bonds of the Fourth Liberty Loan carried with it certain exemption privileges for the Second and Third Liberty Loans. The Victory notes that bore 3¼ per cent interest were exempt except for inheritance and estate taxes; those that bore 4¼ per cent were subject to surtaxes and excess profits taxes as well as to inheritance and estate taxes.

³¹ The certificates had a maturity value of \$5 and bore interest at about 4½ per cent. The stamps of 25¢ bore no interest, but could be exchanged in sufficient volume for certificates.

Expenditures began to decline in 1920 and were only one-third as much in that year as they had been in 1919. A reduction of taxes from their wartime level was to be expected. In 1921 the excess profits tax was repealed, and various excises and special taxes were repealed or reduced. Personal income taxes were reduced four times during the 1920's, and a reduction on earned income, which had been recommended almost continually since the War Between the States, was allowed in 1924.³² The corporate income tax was reduced for the years 1919-1921, only to be increased in 1922, 1925, and 1926. It was reduced again in 1928 and 1929.

The estate tax became a permanent part of the Federal revenue system after the First World War. Hitherto it had been treated as an emergency levy and repealed with the return of peace. Not only was the tax retained, but, contrary to the trend of general taxation, the rates of the estate tax were increased in 1924. A gift tax was also imposed to prevent evasion of the estate tax, but this tax was repealed two years later. The law of 1924 also provided that a credit of 25 per cent of the Federal estate tax would be granted for an inheritance or estate tax paid to any state. All but three states had inheritance taxes at this time. The credit in the Federal law was designed to leave the states with some revenue from this tax and also to promote uniformity in state tax laws. The estate tax was reduced in 1926 and the tax credit was increased to 80 per cent. The Federal tax credit did not produce the hoped-for uniformity, however, either in the form of state taxes or in state tax rates. Only a few states gave up their inheritance taxes for estate taxes, while most states absorbed the Federal credit by supplementing their inheritance taxes with estate taxes.³³

During the 1920's the administration followed a policy of balancing the budget and repaying the debt. In spite of the reduction of taxes, surpluses continued to flow into the Treasury for 11 years. The public debt, which had stood at more than \$25,000,000,000 in 1919 had been reduced to less than \$16,000,000,000 by 1930.³⁴ Interest on the public debt, however, had a more important place in the Federal budget in 1932 than in 1914. In 1932 it accounted for over 13 per cent of Federal expenditures as compared with 3 per cent in 1914.

³² By 1929 the normal rate of the personal income tax was $\frac{1}{2}$ per cent on the first \$4,000, 2 per cent on the second \$4,000, and 4 per cent on income over \$8,000, as compared with 6 per cent on the first \$4,000 and 12 per cent on income over \$4,000 in 1918. Surtaxes, which in 1918 had begun at 12 per cent on income over \$5,000 and extended to 65 per cent on income over \$1,000,000, began at 1 per cent on income over \$10,000 in 1926 and extended to 20 per cent on income over \$100,000.

³³ Oakes, E. E., "The Federal Offset and the American Death Tax System," *Quarterly Journal of Economics*, Vol. LIV, No. 4, Aug. 1940.

³⁴ The average rate of interest on the debt had increased from about 2.4 per cent in 1916 to a high point of 4.3 per cent in 1921, and then decreased to 3.5 per cent in 1932.

With the depression that followed the crisis of 1929 the period of surpluses came to an end. Revenue dropped off as income decreased and business collapsed. At the same time there was a great demand for the Federal Government to do something for the large numbers of unemployed. In October, 1930, President Hoover appointed an Emergency Committee for Employment, the purpose of which was to help obtain work for the unemployed. It had no funds and did little except try to stimulate local activities. Firm in the belief that relief needs should be met by local resources, it suggested public works to state and local governments and urged industry to stabilize employment policies. "The Committee slogans seemed to be 'give a job' and 'spread the work.'" ³⁵ The situation remained very unsatisfactory, and a year later, in August, 1931, President Hoover appointed the Organization on Unemployment Relief, known as the Gifford Committee. This committee took practically the same position as the previous one, although it put greater emphasis on state aid for localities: it was opposed to the giving of aid for relief by the Federal Government.

As the situation grew worse, opposition to Federal aid weakened. In 1932 Congress passed the Emergency Relief and Construction Act, which made a fund of \$300,000,000 available for loans to states and localities for relief purposes.³⁶ This legislation, however, did little to improve matters. Many communities that were greatly in need of aid were not in a position to borrow, since they had no satisfactory collateral or had exhausted their borrowing power. Nor were all the states willing to assume responsibility for the unemployed; six states did not borrow at all. The Act also appropriated \$322,000,000 for the expansion of Federal public works and made \$1,500,000,000 available for the financing of self-liquidating projects undertaken by public and private bodies. The requirement that projects should be self-liquidating, however, proved to be a "formidable barrier."³⁷

By 1931 the depression was beginning to be reflected in smaller revenues and in deficits. The administration was concerned that the budget should be balanced; and, as it was obvious that there were going to be greater demands for Federal expenditures, an increase in taxes was indicated. The Revenue Act of 1932 raised the personal income tax, lowered exemptions, and eliminated the credit for earned incomes. The rates of the estate tax were more than doubled and the gift tax was re-enacted. Numerous manufacturers' excises, a tax of one cent per gallon on gasoline, and various other taxes were levied.

³⁵ Josephine C. Brown, *Public Relief, 1929-1939*, p. 70. New York: Henry Holt and Company, 1940.

³⁶ States were to repay these loans through deductions in the future from Federal grants for roads, but this provision for repayment was repealed two years later.

³⁷ J. Kerwin Williams, *Grants-in-Aid Under the Public Works Administration*, p. 32. New York: Columbia University Press, 1939.

State and local finances

Grants to the states from the Federal Government were of little importance before the First World War, constituting only 1.2 per cent of all state revenue in 1915.³⁸ But in 1916 an act was passed providing for Federal grants to states for highways. Grants for this purpose accounted for 90 per cent of all Federal grants until 1933. By 1932, grants from the Federal Government constituted 10.6 per cent of state revenue.

State and local expenditures increased more than fourfold in the years from 1913 to 1932, or from about \$2,000,000,000 to about \$8,500,000,000. These expenditures, however, were a somewhat smaller proportion of all Governmental expenditures at the later date because of the more rapid growth of Federal expenditures; they constituted 75 per cent of all Governmental expenditures in 1913 as compared with 65 per cent in 1932.

Schools accounted for over 38 per cent, or the largest proportion, of state expenditures in both 1915 and 1932. With the exception of expenditures for highways, there was little expansion of state functions during these years. Expenditures for highways, however, increased greatly, and in 1932 took the place of hospitals and institutions as the second most important item of expenditure.

There were some important changes in the sources of state revenue between 1914 and 1932. Property taxes produced over 63 per cent of all state taxes in 1915, but only about 26 per cent in 1932. Furthermore, at the end of this period more than half of the states had adopted some scheme of classification as compared with only about one-fourth at the beginning of the period. Several new sources of revenue were developed. Most notable among them were gasoline taxes and sales taxes, which together accounted for over 26 per cent of all state taxes in 1932. The gasoline tax, which was first adopted by Oregon in 1919, was being levied by every state ten years later. Sales taxes were the product of the depression in most cases. They had the definite advantage of producing revenue at a time when property taxes were very difficult if not impossible to collect, and when the base of the income tax was declining.

³⁸ Henry J. Bitterman, *State and Federal Grants-in-Aid*, p. 136. New York: Mentzer, Bush, and Company, 1938. Beginning with the passage of the Northwest Ordinance of 1787, Congress provided that certain public lands should be devoted to educational purposes. The Morrill Act of 1862 had donated lands to the states for the endowment of colleges of agriculture and the mechanical arts, and the Second Morrill Act of 1890 granted annual funds for the same purposes. The Hatch Act of 1887 granted an annual sum to each state for agricultural experiment stations. These sums were increased by other acts in the twentieth century. (See Bitterman, p. 125.) Federal funds have also been provided for agricultural extension work, forest fire prevention, the National Guard, vocational education, and the welfare and hygiene of mothers and infants. See A. F. MacDonald, *Federal Aid*. New York: Thomas Y. Crowell Company, 1928.

Moreover, they did not violate the "uniformity" clause of many state constitutions, as did income taxes. These taxes were to be used to an increasing extent after 1932. The income tax had not yet become a major source of revenue, but it was much more widely used than previously.³⁹ In 1911 only one state was levying an income tax, as compared with about one-half of the states in 1931.⁴⁰ The inheritance tax accounted for between 6 and 7 per cent of state revenue both at the beginning and at the end of this period. Two more states had adopted such a tax by 1932, bringing the total number to 47, Nevada being the only exception.

Highways not only accounted for an increase in state expenditures, but they were also the most important factor in the growth of state debt from \$400,000,000 in 1912 to more than \$2,500,000,000 in 1932. The growth of local debt from \$4,000,000,000 in 1912 to \$16,500,000,000 in 1932 was almost as rapid. As a result of the great increase in the Federal debt, however, state and local debt represented only about 50 per cent of all public debt in 1932, whereas it had represented about 79 per cent in 1912.⁴¹

1933-1943

Federal finances

With the inauguration of Franklin D. Roosevelt as President in 1933, no immediate break was made with the policies followed by the previous administration. A balanced budget was still considered desirable, and the deficits incurred in the early years of this administration were regarded as unfortunate but inevitable under the circumstances. The policies followed at this early date were not entirely consistent. On the one hand taxes were increased, regular expenditures were cut, and salaries were reduced, while on the other hand liberal expenditures were made for relief purposes. An attempt was made to reconcile these opposing policies by the device of the double budget, one part of which dealt with normal expenditures and the other with emergency expenditures.⁴² The depression was thought to be temporary. Banking reform was expected to restore business confidence and faith, and the devaluation of the dollar was expected to result in an increase in prices, which in turn would lead to greater profits and increased employment. The National Industrial Recovery Act, which provided for minimum wages, maximum

³⁹ It produced 0.1 per cent of state taxes in 1915 and 2.2 per cent in 1932.

⁴⁰ Roy G. Blakey and Violet Johnson, *State Income Taxes*. Chicago: Commerce Clearing House, 1942. Not all states with an income tax applied the levy to both personal and corporate income.

⁴¹ In 1922, before much progress had been made in repaying the Federal debt incurred during the war, state and local debt had been only 27 per cent of the total.

⁴² The "double budget was far from being a 'current' and 'capital' budget, or even an 'ordinary' and a 'loan' budget." See Ratner, *American Taxation*, p. 461.

TABLE 6
FEDERAL EXPENDITURES AND REVENUE, 1933-1943¹
(In millions of dollars)

EXPENDITURES									
	<i>National Defense</i>	<i>Veterans</i>	<i>Public Works</i>	<i>Aid to Agri- culture</i>	<i>Relief and Work Relief</i>	<i>Interest on Public Debt</i>	<i>Social Security Program</i>	<i>Other</i>	<i>Total</i>
1933...	680	863	442	204	350	689		635	3,864
1934...	531	557	698	775	1,845	757		849	6,011
1935...	689	607	883	1,071	2,267	821		672	7,010
1936...	890	2,351	730	933	2,245	749	29	729	8,666
1937...	929	1,137	1,024	971	2,282	866	184	784	8,177
1938...	1,029	582	804	854	1,803	926	482	760	7,239
1939...	1,206	557	1,000	1,228	2,532	941	454	789	8,707
1940...	1,657	557	949	1,559	1,856	1,041	513	866	8,998
1941...	6,301	563	738	937	1,632	1,111	588	840	12,711
1942...	26,011	556	680	1,225	1,133	1,260	659	873	32,397
1943†..	.....	.....	.....	.....	.....	.....	.....	.....	78,179
REVENUE									
	<i>Customs</i>	<i>Income and Profits</i>	<i>Liquor</i>	<i>Tobacco</i>	<i>Manuf. Excises</i>	<i>Employ- ment</i>	<i>Misc.</i>	<i>Total</i>	
1933.....	251	746	43	403	244		394	2,080	
1934.....	313	819	259	425	385		929	3,116	
1935.....	343	1,099	411	459	342		1,146	3,800	
1936.....	387	1,427	505	501	383		923	4,116	
1937*.....	486	2,163	594	552	450	266	517	5,029	
1938*.....	359	2,640	568	568	417	743	559	5,855	
1939*.....	318	2,189	588	580	397	740	352	5,165	
1940*.....	349	2,125	624	608	447	834	400	5,387	
1941*.....	392	3,470	820	698	617	926	684	7,607	
1942*.....	389	7,960	1,048	781	772	1,185	664	12,799	
1943†.....	...	.....	.....	...	...	.....	...	22,282	

¹ Secretary of the Treasury, *Annual Report*. Because of rounding of figures, totals will not check in all cases. Figures for liquor, tobacco, and manufacturers' excises are on the basis of reports of collections; other figures for revenue are on the basis of daily Treasury statements (unrevised).

* Exclusive of net receipts under Title VIII of the Social Security Act.

† Detailed classification not yet available.

TABLE 7
FEDERAL DEFICITS AND DEBT, 1933-1943¹
(In millions of dollars)

DEFICITS		DEBT	
1933.....	1,784	1933.....	22,224
1934.....	2,896	1934.....	22,534
1935.....	3,209	1935.....	27,876
1936.....	4,550	1936.....	32,925
1937.....	3,149	1937.....	35,921
1938.....	1,384	1938.....	36,720
1939.....	3,542	1939.....	39,934
1940.....	3,611	1940.....	42,585
1941.....	5,103	1941.....	48,610
1942.....	19,598	1942.....	72,139
1943.....	55,897	1943.....	135,380*

¹ Secretary of the Treasury, *Annual Report*.

* Unrevised.

hours, and codes of fair competition, was likewise an attempt to stimulate business. The reciprocal trade agreements were also expected to promote recovery. Aid to agriculture was extended through a further development of agricultural credit institutions and the creation of the Agricultural Adjustment Administration. The Agricultural Adjustment Act of 1933 was designed to increase farmers' incomes both by cash payments and by an increase in the market price of agricultural products. Farmers were to be paid for curtailing their acreage of certain commodities so that smaller supplies would force prices up and give farmers better incomes. It was intended that part of the payments to farmers should come from taxes on processors, but these taxes were declared unconstitutional in January, 1936.

A more direct attack upon the problem of unemployment was made by an appropriation in the National Industrial Recovery Act of \$3,300,000,000 for the Public Works Administration, which was placed under the supervision of Harold L. Ickes, Secretary of the Interior.⁴³ The purpose of PWA was not to give relief but to provide work for the unemployed. The program was slow in getting started because state and local governments lacked plans for projects and because they were not in a position to pay their part of the cost.⁴⁴

In the spring of 1933 about 15,000,000 persons were unemployed, and some kind of action was imperative. In May, 1933, Congress passed the Federal Emergency Relief Act. This Act has been called a "new and social interpretation of the 'welfare' clause in the Federal Constitution which had served to restrict Federal relief policy since the middle of the nineteenth century."⁴⁵ It has also been said that in this Act "President Roosevelt virtually threw a challenge back over eighty years to his predecessor, President Pierce," who had maintained in 1854 that "the welfare clause in the Constitution did not give Congress the power to provide for the indigent insane nor for any indigent persons."⁴⁶ This Act provided \$500,000,000 for relief, one-half of which was to be distributed to the states on a matching basis, and one-half according to their needs for relief funds and their ability to meet those needs.⁴⁷ The administration of the funds, however, was in the hands of local govern-

⁴³ "The generally accepted theory of P. W. A. officials was that the public works 'pump priming' program would be of short duration, and that it would therefore be unnecessary and possibly wasteful to create new positions when existing departmental facilities might be utilized." Williams, *Grants-in-Aid Under the Public Works Administration*, p. 84.

⁴⁴ Under the Act of 1933 the Federal Government contributed 30 per cent of the cost of labor and materials; under the Act of 1935, it contributed 45 per cent of the total cost of the project. See Williams, *Grants-in-Aid Under the Public Works Administration*, pages 120 and 133.

⁴⁵ Brown, *Public Relief, 1929-1939*, p. 147.

⁴⁶ Brown, *Public Relief, 1929-1939*, p. 147.

⁴⁷ One dollar of Federal funds was to be granted for every two dollars of state and local funds,

ments, which were supervised by state emergency relief administrations.⁴⁸ Whereas the Federal Government had loaned funds previously, it was now donating them. Although the Act merely provided funds for relief, there was a preference from the beginning for work relief over direct relief. Projects were initiated by local governments and approved by the FERA.

Progress under this program was slow, however, and in November, 1933, an agency known as the Civil Works Administration was created to provide employment on local projects to take the place of direct relief. Under the Civil Works program, which was administered by the Federal Government, the earnings of an individual were not limited by his needs, as they had been under the FERA. Only half of the workers employed under this program, which included construction and improvement work, as well as professional and clerical work, were drawn from the relief rolls. In January, 1934, the CWA was employing 4,260,000 persons. From that time on, the program was curtailed and was officially ended in July. Charges of political corruption and wastefulness and the fact that this program was more expensive than direct relief contributed to its termination. The task of providing for the unemployed was once again in the hands of the FERA, which had not gone out of existence while the CWA was active, but had continued making grants to states for direct relief. The FERA set up an Emergency Work Relief program that provided various kinds of work for the unemployed and continued to give some direct relief. States and localities were no longer required to match Federal funds. The program was managed in large part, however, by the states and localities rather than by the Federal Government as had been the case before the CWA was established. Only persons on relief were to be employed on these projects, and their earnings were to be limited according to their needs. A total of over \$3,000,000,000 was appropriated for the FERA during its existence.

The year 1935 marked a change in the attitude of the administration toward Government expenditures. As already noted, until that time deficits had been regarded as unfortunate but more or less inevitable. Large expenditures had been considered not as desirable in themselves but as necessary to prevent suffering. But beginning with 1935, the theory of pump-priming gained great vogue. It was believed that large expenditures by the Government for relief would bring recovery by increasing the purchasing power of consumers. Consumers' goods industries would be stimulated and would hire more workers and order more materials. Eventually the stimulus would spread to the producers' goods industries. Insofar as funds were spent on public works, it was held

⁴⁸ In six states the Federal Government retained control over the expenditure of funds for a period of time. See Edward E. Williams, *Federal Aid for Relief*, pp. 175-179. New York: Columbia University Press, 1939.

that the expenditures would directly stimulate business by increasing the demand for such materials as steel, lumber, and cement, and thus finally lead to still more employment. Consequently, expenditures were no longer regarded as burdensome but rather as the key to recovery.

A new policy was also adopted in 1935 with regard to relief. A distinction was henceforth to be made between "employables" and "unemployables." The Federal Government was to withdraw from the field of direct relief. It was to provide work for the "employables," but the "unemployables" were to be the responsibility of the states and localities. The Works Progress Administration, with Harry Hopkins at its head, was established in 1935 to take care of the employables and the FERA was disbanded.⁴⁹ By the winter of 1936 the WPA was giving employment to between three and four million persons. Like the CWA, and unlike the FERA, the WPA was a Federal program. No lump-sum grants were made to the states as under the FERA, but each project was considered individually. Projects were initiated locally and approved by the WPA. Local governments contributed an average of about 20 per cent of the total cost of projects. When the WPA was originally established, it was provided that not more than 10 per cent of the workers could be drawn from non-relief sources, and this proportion was reduced to 5 per cent in 1937, but a worker's earnings were not limited by his needs, as they had been under the FERA.⁵⁰

A system of social security was established later in the year under which provision was made for insuring the aged and the unemployed and under which assistance was offered to the states for the care of certain classes of dependents. A payroll tax of 1 per cent was imposed upon both employers and employees for old-age insurance.⁵¹ This tax was to increase gradually until it reached 3 per cent in 1949, but the scheduled increase in the rate was postponed in 1939. Upon retirement at age 65 or later, an insured worker receives an annuity based upon the length of time he has contributed to the fund, upon the amount of his wages, and upon his dependents. Benefits are to be not less than \$10, nor more than \$85, a month. Payment of benefits was originally supposed to begin in 1942, but the Act of 1939 provided that benefits should begin in 1940. This later act also changed the scale of benefits

⁴⁹ On July 1, 1929, this agency was renamed the "Works Projects Administration." See Secretary of the Treasury, *Annual Report*, 1940, p. 27.

⁵⁰ The activities undertaken by the WPA were legion. They included the construction of highways and streets, public buildings, and sanitation and drainage systems, and irrigation, flood, and erosion projects. Among them were "Public health nursing projects, nursery schools, sanitation surveys, clerical aid in libraries, city clerk's offices . . .," as well as community sewing rooms, adult education, and projects for artists, musicians, writers, and the theatrical profession. The National Youth Administration, which was originally part of the WPA, although it became independent later, gave part-time employment to "needy students between the ages of 16 and 25" and also to needy youths not in school.

⁵¹ The tax applies only to the first \$3,000 of wages or salaries.

somewhat and provided more liberally for married persons and those with dependents. In fact, the Act of 1939 has been described as a "further movement in the direction of subsidization of particular groups, e.g., the present old, the needy, the married . . ." ⁵² Not all workers are covered by the plan for old-age insurance. Some groups were excluded because they were already covered by pension systems and others because the practical difficulties of including them were considered to be too great. Among those excluded are railroad workers, Government employees, employees of religious, charitable, and certain other nonprofit-making institutions, officers and members of the crews of vessels on the navigable waters of the United States, and agricultural, casual, and domestic labor.

The plan for unemployment insurance, however, was not a Federal one in the same sense as that for old-age insurance. A Federal tax was imposed upon all employers of eight or more persons, but a credit of 90 per cent was granted for a tax paid to any state on account of unemployment insurance. ⁵³ The granting of a credit for the payment of a similar tax to any state that had set up a system for unemployment compensation approved by the Federal Government was intended to stimulate the states to adopt plans for unemployment insurance. A similar device had been used in 1924 to encourage the states to adopt inheritance taxes. The tax on employers, which began at 1 per cent in 1936, has been 3 per cent since 1938. Every state has a plan for unemployment insurance, but the laws are far from uniform. Employers only are taxed in 42 states, employees being required to make contributions in only six states. ⁵⁴ The waiting period before benefits are paid, the amount of benefit, and the length of the period during which payment is made vary from state to state. As in the case of old-age insurance, not all workers are covered by the plans for unemployment insurance.

While the plan for old-age insurance was Federal in character and the plans for unemployment insurance were to be primarily the concern of the states, provision for other groups of dependents was to be

⁵² Seymour Harris, *Economics of Social Security*, pp. 196-197. New York: McGraw-Hill Book Company, 1941. According to the original plan, contributions in the earlier years would exceed benefits, and the excess would be paid into a reserve fund, which was to be invested in Government bonds and the earnings of which would help support the plan in later years, when contributions would be less than benefits. Under the Act as originally passed, it was generally assumed that a reserve of \$47,000,000,000 would be accumulated, but the size of the reserve has been very greatly reduced by the Act of 1939. See Harris, p. 164.

⁵³ In some states the system has been extended to firms employing fewer than eight persons.

⁵⁴ Ralph T. Compton, *The Social Security Payroll Taxes*, p. 46. New York: Commerce Clearing House, 1940. The highest tax on employees is 1.5 per cent in Rhode Island; the lowest, 0.5 per cent in Louisiana. Taxes of 1 per cent are levied in Alabama, California, Kentucky, and New Jersey.

both state and Federal.⁵⁵ The Federal Government was to bear part of the expense of the new program, but states and localities were required to assume the initiative and responsibility. Since not all workers are covered by old-age insurance, and since some workers are already too old to benefit much if at all from the system, some provision had to be made for the indigent aged. The Federal Government agreed to contribute one-half the amount paid as old-age assistance up to \$30 a month, or a maximum contribution of \$15 a month. In 1939 the Government's contribution was raised to one-half the amount paid up to \$40 a month, or a maximum contribution of \$20 a month. It agreed to pay the same proportion and same maximum amount for needy blind persons. Provision was also made for dependent children. The Federal Government agreed to contribute one-third of the amount paid for dependent children, or a maximum amount of \$6 for one child in the home and \$4 for each additional child. By 1941, 42 states and the District of Columbia were eligible to receive the Federal contribution for dependent children, and 41 states and the District of Columbia were eligible to receive the contribution for the blind.⁵⁶

In the meantime general economic conditions had improved. Production had increased rapidly during 1935 and 1936. An extra stimulus was given to it in 1936 by the payment of the veterans' bonus, which amounted to more than \$2,000,000,000. Recovery seemed to be progressing satisfactorily in 1937, and the Government began to reduce its expenditures. During the latter part of the year, however, there was a severe "recession"—a great decline in production and a sharp increase in unemployment.

The increased public spending of 1938 through larger appropriations for PWA and WPA marked a second change in the attitude toward Government spending, and was based on a theory different from that underlying the public spending of 1935-1937.⁵⁷ The idea came to be accepted in Administration circles that expenditures were needed not temporarily to prime the pump, but permanently to make up for the lack of private investment. Savings that are withdrawn from the income stream must be returned through investment or prices will fall and unemployment and depression will result. It was believed that we were experiencing not a downswing of the business cycle but rather secular stagnation, which was characteristic of the maturity that our economy had reached. The hypothesis that ours was a mature economy, and that we were therefore in a period of secular stagnation, was based upon three propositions: (1) the decline in the growth of population; (2) the

⁵⁵ The Social Security Act also provided for assistance to the states for public health work.

⁵⁶ Social Security Board, *Annual Report*, 1941, p. 114.

⁵⁷ See J. H. Williams, "Deficit Spending," *American Economic Review*, Vol. XXX, No. 5, Feb., 1941.

disappearance of our geographical frontier; and (3) the absence of important new inventions or technological advances.⁵⁸ Since it was believed that there was a permanent lack of opportunities for private investment, it was held that unemployment and a general breakdown of the economy could be avoided henceforth only by large Government expenditures.

With the outbreak of the war in Europe, the general economic picture changed. Production increased, and expenditures for the WPA gradually declined from their high point in the fiscal year 1939. There was a tremendous growth in expenditures for war activities. Appropriations for the war program by June 1943 amounted to about \$245,000,000,000, including over \$60,000,000,000 made on lend-lease account.⁵⁹ There was some reduction in nonwar expenditures—a drop from about \$7,500,000,000 in 1940 to \$6,000,000,000 in 1943—but this decrease was greatly outweighed by military expenditures. Military and nonmilitary expenditures together amounted to about \$78,179,000,000 in 1943.

In line with the desire for a balanced budget in the first few years of the Roosevelt administration, heavier taxes were levied. After the adoption of the theory of recovery through Government spending, taxes continued to be increased—not, however, primarily to obtain more revenue, but rather “to prevent an unjust concentration of wealth and economic power,” as the President put it, and to influence business to adopt policies that it was believed would promote recovery. Mention has already been made of the AAA taxes imposed in 1933 on processors of certain farm products. The manufacturers’ excises and other taxes imposed in 1932 were extended and the tax on gasoline was increased. With the repeal of prohibition in 1933, heavier taxes were levied on liquor. Two additional taxes were levied on corporations in 1933—the one a capital stock tax, and the other an excess profits tax of 5 per cent on corporate net income in excess of 12½ per cent of the declared value of the capital stock. Taxes were further increased in 1934 and 1935. The normal rate of the personal income tax was made a flat 4 per cent and

⁵⁸ For a presentation of this point of view, see Alvin H. Hansen, *Fiscal Policy and Business Cycles* (New York: W. W. Norton and Company, 1941); Arthur E. Burns and Donald S. Watson, *Government Spending and Economic Expansion* (American Council on Public Affairs, 1940). For an opposing argument, see C. O. Hardy, “Fiscal Policy and National Income: Review,” *American Economic Review*, Vol. XXXII, No. 1, Part 1, March, 1942. Also see J. W. Angell, *Investment and Business Cycles* (New York: McGraw-Hill Book Company, 1941); William Fellner, “The Technological Argument of the Stagnation Thesis,” *Quarterly Journal of Economics*, Vol. 55; and David McCord Wright, *The Creation of Purchasing Power* (Cambridge, Massachusetts: Harvard University Press, 1942).

⁵⁹ About 40 per cent of the appropriations for lend-lease, the first of which was made March 1941, were direct authorizations and the rest were transfer authorizations. The latter represented the monetary value of armaments that the President was authorized to transfer to the Allies at his discretion. It was hoped that through lend-lease aid many of the difficulties raised by war debts after the First World War could be avoided and that yet help could be extended to the United Nations.

surtax rates were raised. The fact that many Federal securities were exempt from the normal tax but not from the surtax was the reason for raising surtaxes rather than the normal tax. The earned income credit, which had been abolished in 1932, was restored in 1934.⁶⁰ The rates of the estate tax and the gift tax were increased in both 1934 and 1935. The corporate income tax and the excess profits tax were increased and made progressive in 1935.⁶¹ An undistributed profits tax, one of the most contested taxes in recent years, was levied in 1936 to induce corporations to distribute their earnings to their stockholders. This tax varied with the amount of undistributed profits. There were five brackets, ranging from a tax of 7 per cent on undistributed profits not in excess of 10 per cent of net income to a tax of 27 per cent on those over 60 per cent of net income. Besides providing revenue, the tax was intended to bring about greater equity between incorporated and unincorporated enterprises. It was also believed that the tax would result in greater stability by reducing the volume of corporate savings and the amount of funds withdrawn from the income stream. Furthermore, it was held that it would make for fewer maladjustments and better allocation of investment funds by forcing those funds to go through the market, where they would flow to the highest bidder.⁶² The tax was modified in 1938 and finally repealed in 1939. Partly to compensate for the repeal of the undistributed profits tax, the corporate income tax was increased in 1938 and 1939.

With the beginning of the defense program, it became obvious that very much heavier taxes would have to be levied. Personal exemptions were reduced first to \$750 for single and \$1,500 for married persons, and then to \$500 and \$1,200. The normal tax was raised to 6 per cent and surtaxes were increased.⁶³ A Victory tax of 5 per cent of net income, to be

⁶⁰ The credit was thereafter to be 10 per cent, however, instead of 25 per cent as previously.

⁶¹ The corporate income tax had previously been 13½ per cent, but under the Act of 1935 there were four brackets, extending from a tax of 12 per cent on the first \$2,000 of net income to 15 per cent on net income over \$40,000. Before these rates went into effect, they were superseded by the rates of the 1936 act, which were lower in all brackets except the highest. Corporations were also required to include 10 per cent of the dividends received from domestic corporations in their ordinary income. This proportion was changed to 15 per cent in 1936. The excess profits tax was increased to 6 per cent on net income that was more than 10 per cent but less than 15 per cent of the declared value of the capital stock, and 12 per cent on net income over 15 per cent. The capital stock tax was increased from \$1 to \$1.50 per \$1,000 of the declared value of capital stock, but the higher rate was never effective, since the Act of 1936 reduced it to \$1.

⁶² See: A. G. Buehler, *The Undistributed Profits Tax*. New York: McGraw-Hill Book Company, 1937. M. S. Kendrick, *The Undistributed Profits Tax*. Washington, D. C.: Brookings Institution, 1937.

⁶³ In 1942 the highest surtax rate was 82 per cent on net income over \$5,000,000. In line with the effort to plug tax loopholes in the interests both of justice and of greater revenue, the Public Salary Tax Act was passed in 1939, which provided that state and local officials were to be subject henceforth to the Federal income tax. This action accorded with "recommendations which had been made by Presi-

currently withheld from wages and salaries, became effective January 1, 1943. A specific exemption of \$624 was allowed to each taxpayer under this tax regardless of marital status and number of dependents. Deductions allowed were less liberal than under the income tax, being confined mainly to expenses incurred in business or in connection with income-producing property. With a view both to forestalling inflation and to making the payment of income taxes easier, Congress provided for the current withholding of 20 per cent of wages and salaries beginning July 1, 1943. The rates of the income tax were not changed, but the Victory tax was to be included in the 20 per cent withheld. The corporate income tax was likewise increased. Increases were also made in some internal revenue taxes. A second excess profits tax was levied in 1940, and the one already in effect came to be known as the "declared value excess profits tax." The second tax was enacted because of the need for additional revenue and because of the feeling that nobody should be allowed to grow rich as a result of the war.⁶⁴

But even with heavier taxes revenue in 1943 amounted to only \$22,282,000,000. The budget was far from balanced, and the Government had to borrow large amounts. An effort was made to avoid the fallacies involved in the First World War slogan of "Borrow and Buy," and to put Government bonds directly into the hands of individuals, thus reducing consumer purchasing power. Bonds were issued in various denominations. War stamps were issued which bore no interest, but which could be exchanged in the proper amounts for bonds. Although there was some talk of a scheme of compulsory loans similar to that in effect in England, no such plan had been adopted up to the summer of 1943. Emphasis was placed rather upon campaigns for individuals to put a certain proportion of their incomes into war bonds.

Annual deficits from 1933 to 1943 resulted in a rapid increase in the Federal debt. From over \$22,000,000,000 in 1933 it had grown to more than \$135,000,000,000 in 1943.⁶⁵ But the larger debt was not so much more burdensome as might be supposed because of the low level of interest rates in the 1930's and the refunding of many earlier issues.⁶⁶

dents Harding and Coolidge and all secretaries of the Treasury since 1919." Ratner, *American Taxation*, p. 486. This Act also applied to those Federal judges heretofore immune from the tax.

⁶⁴ Originally this tax was progressive, but under the Revenue Act of 1942 a flat rate of 90 per cent was levied. In no case, however, is the total normal tax, surtax, and excess profits tax to exceed 80 per cent of surtax net income. All corporations are allowed a specific exemption of \$5,000 in computing this tax plus a credit equal to either (a) 95 per cent of earnings in the base period 1936-1939 or (b) 8 per cent of the first \$5,000,000 of invested capital, 7 per cent of the next \$5,000,000, 6 per cent of the next \$10,000,000, and 5 per cent of all over \$200,000,000.

⁶⁵ The latter figure does not include obligations of governmental corporations and credit agencies guaranteed by the United States, which amounted to over \$11,000,000,000 in 1943.

⁶⁶ The average rate of interest on the public debt decreased from approximately 3.4 per cent in 1933 to approximately 2.6 per cent in 1936, and was less than 2 per cent in 1943.

Interest payments increased from \$689,000,000 in 1933 to \$1,808,000,000 in 1943; but, because of the greater growth in other expenditures, they were only about 2 per cent of Federal expenditures at the latter date as compared with about 18 per cent at the earlier date. It was necessary to extend the legal debt limit of \$45,000,000,000 imposed by the Second Liberty Bond Act of 1917 three times in these years. In June, 1940, it was extended to \$49,000,000,000; in February, 1941, to \$75,000,000,000; in March, 1942, to \$125,000,000,000; and in 1943, to \$210,000,000,000.

State and local finances

States were aided to an increasing extent after 1930 by grants from the Federal Government. In 1941 these grants amounted to \$744,200,000, compared with \$217,100,000 in 1932. They varied from 18.5 per cent of state and local revenue in Nevada to 3.3 per cent in New York. The largest amount of grants had hitherto been made for highways, but with the beginning of payments for public assistance under the Social Security Act of 1935 grants for highways ranked second in size. Grants for education ranked third and those for agriculture, fourth.

State aid to local government also grew in importance, varying in 1941 from 48.8 per cent of local revenue in Delaware to 6.1 per cent in Oregon. The largest grants were those for education, although large sums were also appropriated for public assistance and for highways. Only about 10 per cent of state grants were made for unspecified purposes.

The early and middle 1930's represented a difficult period in state and local finance. While the financial requirements of state and local governments remained as large as ever, and even increased in numerous cases, their revenue dropped off sharply. In many cases no new sources of revenue were available and it was impossible to borrow. The result was a considerable number of defaults on their obligations by these governmental units.

State and local expenditures increased from about \$6,500,000,000 in 1933 to \$9,500,000,000 in 1941. Most of the increase was to be accounted for by expenditures for relief. Many local governments were not able to care for their unemployed because property tax valuations and collections declined and no other source of revenue was available to local governments. The states had broader borrowing power and broader taxing power, and therefore took over a large part of the burden of relief. Whereas states spent 40 per cent of their budgets for schools in 1930, or more than twice as much as they spent for any other purpose, by 1938 expenditures for schools, which were 38 per cent of all expenditures, were closely followed by expenditures for "charities," which were 25 per cent of the total.

There were also some changes in the sources of revenue. In 1932

property taxes had constituted over 26 per cent of all state taxes, as compared with 7½ per cent in 1941. Classification had made even more progress, and by 1941 only ten states still adhered to the uniformity rule in the taxation of property. Sales taxes and gasoline taxes, which had yielded about 26 per cent of state taxes in 1932, were used by over half the states and accounted for over 40 per cent of the total in 1941. These taxes were the mainstay of state revenue.⁶⁷ In both West Virginia and Illinois sales taxes accounted for over 40 per cent of all state taxes in 1941, while in both Florida and Nebraska the gasoline tax accounted for more than 50 per cent of all state taxes. Income taxes also grew in favor in these years: in 1941 they produced about 11 per cent of state taxes as compared with about 8 per cent in 1932. They were being used by almost three-fourths of the states at the end of this period as compared with about one-half at the beginning. New York derived 33 per cent of its state taxes from the income tax in 1940, or a larger proportion than any other state. The depression and the search for new sources of revenue, together with the favorable decision of the Supreme Court in 1931 on the Indiana law taxing chain stores, gave an impetus to the use of chain store taxes, which were in effect in more than 20 states in 1940.⁶⁸ From a fiscal point of view, however, these taxes were unimportant, producing less than 1 per cent of all state taxes in 1940.

As a result of the adoption of various new taxes, increased rates of old ones, and liberal grants by the Federal Government, state and local debt grew less than \$1,000,000,000 between 1932 and 1941, in spite of greatly increased demands upon those levels of government. Consequently, state and local debts, which had accounted for about 50 per cent of all public debt in 1932, accounted for only about 30 per cent in 1941.

Conclusion

A number of important developments stand out in this brief survey of the finances of American government. The most significant of all is the widening scope of government. The Federal Government concerned itself originally with little but protection, and, as a matter of fact, by far the largest part of its expenditures throughout its existence has been made on account of wars. But as the country began to develop, the Federal Government undertook internal improvements of various sorts, and these grew in importance as time passed. In later years, until the outbreak of the Second World War, expenditures for welfare purposes were of the greatest significance, welfare expenditures due both to an

⁶⁷ In about one-fourth of the states, the revenue from the gasoline tax is earmarked for highway purposes.

⁶⁸ R. G. and C. Gladys Blakey, "Chain Store Taxation," *Taxes*, Vol. 19, Nos. 10 and 11, October and November 1941.

awakened social consciousness and to the fact that, with a large proportion of the population dependent upon a job for an existence, business fluctuations have had much more serious consequences than before the country had become so industrialized. The growing importance of government can be seen in the fact that total expenditures for government increased from about 7 per cent of the national income in 1913 to about 24 per cent in 1940. With the beginning of the war program, the Government's position in the economy became even more important. Furthermore, the change in the attitude toward government itself since the era of oppressive monarchies when this country was founded has contributed to the wider scope of government. Our forefathers regarded government as, if not evil, at least unproductive. Bastable, writing at the turn of the century, observed that "state income or revenue is derivative, and is dependent on national income."⁶⁹ There was little appreciation of the fact that the activities of government have an important part in the production of a larger national income. It is estimated that about 12½ per cent of our national income of 1941 was produced directly by government as compared with about 7½ per cent in 1929.⁷⁰

All levels of government have participated in the expansion of functions, but the growth of the activities of the Federal Government has been greater than that of the other levels. The fact that many of the necessary activities could be undertaken better by the Federal Government and that the Federal Government was in a much better position to finance those activities accounted in large part for this development. Federal expenditures, which constituted somewhat less than 25 per cent of all governmental expenditures in 1913, had increased to almost 50 per cent of the total by 1941. There was a similar development in the relation of state and local expenditures; state expenditures were about 14 per cent and local expenditures about 60 per cent of all expenditures in 1913 as compared with 19 per cent and 32 per cent in 1939.

Another important development has been the trend toward the use of direct taxes. Before the First World War, practically all Federal revenue was derived from taxes on commodities. Income and inheritance taxes, which had no place in the tax system of those years during ordinary times, accounted for about 40 per cent of all Federal taxes (including payroll taxes) in 1940 and about 50 per cent in 1941. The tax system as a whole, however, is more regressive than the Federal tax system. Taking account of all levels of government in 1941, income and

⁶⁹ C. F. Bastable, *Public Finance*, 3d ed., p. 135. London: Macmillan and Company, 1903.

⁷⁰ It should be noted that only 12½ per cent of the national income was produced by government, yet government expenditures constituted 24 per cent of the national income. This difference is to be accounted for by the fact that pensions, compensation for injuries, and related payments are included in total government expenditures but are not included in income *produced* by government, since they are essentially transfer payments.

inheritance taxes constituted about 29 per cent and property taxes about 31 per cent of all taxes, while taxes on commodities and motor vehicles made up most of the remainder.

It is obvious that the tax system as a whole is too regressive. Property taxes and, to an even greater degree, taxes on commodities are regressive in effect, since they take a larger proportion of the income of individuals in the lower-income groups than of individuals in the higher-income groups. Less emphasis should be placed upon taxes on commodities and more emphasis upon the income tax. If the Federal Government is to obtain additional revenue from the income tax, however, exemptions will have to be lowered and tax rates will have to be increased in the lower- and middle-income brackets, since the revenue possibilities of the higher brackets have practically been exhausted. Furthermore, income tax rates that are too high have a restrictive effect upon investment and therefore result in a smaller volume of employment and production.

It will be more difficult, however, to make the system as a whole more equitable than to make the Federal tax system more equitable. One of the greatest stumblingblocks in the way of achieving greater justice in the entire system is the difficulty of finding a substitute for the property tax, which serves as the financial support of local governments. Although the income tax is more equitable than the property tax, it is not adapted to local administration. The problem has been met in part, as already noted, through grants from the states to localities. Such grants, however, involve serious problems, varying with the nature of the grant. If the grant-in-aid is not a shared tax, that is, if it does not merely represent revenue collected in the locality by the state government and returned to the local government, there is danger that the local governments receiving grants will tend to lose their independence. If local governments are not responsible for raising the money they spend, they may become inefficient and extravagant in its use. If localities are too closely supervised in the use of this money, however, there may be a weakening of local government and a loss of the values, important to a democracy, that are inherent therein. The same problem has become more important on the Federal-state level within recent years as a result of the growing appreciation of the need for the development of methods that will equalize the benefits and burdens of government. The financial resources and the needs of the various states for public expenditures differ widely. Furthermore, great need for public expenditures is often accompanied by financial weakness rather than by financial strength. Thus, since taxes are only one side of the picture, a more equitable system of government must wait upon the development of methods for equalizing the abilities and the needs of governmental units without, on the one hand, promoting inefficiency and extravagance, or,

on the other, destroying the fundamental nature of state and local governments.

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CHAPTER 30

Industrial Concentration and Government Anti-Trust Policy

The Concentration Movement in American Business

IN THE UNITED STATES after 1870, as in other countries of the Western World, the size of individual industrial firms began to increase rapidly. Many individual companies expanded greatly, and, in addition, groups of firms combined or merged into single business units with very large investments, capacities, and outputs. This movement progressed so rapidly that within 35 years the control of the typical industrial market was concentrated in the hands of relatively few large firms.¹

The movement toward industrial concentration was afoot before 1870 and is continuing today. Between 1879 and 1904, and again in a lesser degree during the 1920's, however, the process of industrial concentration was so rapid that it has often been referred to as a *merger movement*. This merger movement is a primary aspect of the recent development of the American economy, and accordingly some attention must be devoted to its principal origins, to the details of its development, to its effects on the structure of the modern economy, and to the problems it has raised for public policy toward industry.

The rise of large-scale industrial firms

The development of industrial concentration, or in a narrower sense, the rise of "monopolies" or "trusts," was in no sense an aberration from the orderly development of a free enterprise economy. It was rather one of the several phases of the adaptation of economic life to the primary stimuli of technological innovation that had influenced the in-

¹ The growth in the *average* size of individual firms from 1849 to 1899 is indicated by the following data from W. L. Thorp's *The Integration of Industrial Operations* (Census Monograph III, Washington, 1924, pp. 28-30) for factories and hand and neighborhood industries:

Year	Average Value of Product	Year	Average Value of Product
1849.....	\$ 8,284	1879.....	\$21,152
1859.....	13,429	1889.....	26,371
1869.....	13,428	1899.....	25,382

These figures, however, understate the progress of concentration because they do not recognize the increasing dispersion among the sizes of firms. By 1904 there were at least 318 large industrial combinations in the United States that had assimilated no less than 5,200 original plants. Many of these controlled more than half the output of their respective industries. (See John Moody, *The Truth About the Trusts*, pp. 485-487. New York: Moody Publishing Company, 1904.)

dustrial development of the preceding century. Improvements in methods of textile making, a revolution in the technique of iron and steel manufacture, the development of steam power, and the building of railroad systems had provided the technological basis for the shift of production to factories, for the movement of population to the cities, and for the organization of the production of more and more goods under the direction of private enterprise. As this reorganization of the economy was proceeding, a further implication of the technical revolution became evident, namely, that industrial firms would find it both more economical and more profitable to expand, to integrate, and to combine.

The growth in the scale of individual plants was rapid in the years immediately following the War Between the States. In the 1870's, while the number of manufacturing establishments was virtually constant, capital investment in manufacturing rose 65 per cent; and the value of industrial output, 58 per cent. The strong firms in many industries, moreover, grew much more rapidly than the average, driving out of business or reducing to relative unimportance their weaker competitors. In the 1880's the principal establishments in many industries had attained, as judged by current standards, moderately large-scale production.

This growth of large-scale plants was in part attributable to the superior efficiency or enterprise of certain manufacturers. In large part, however, it was the result of the fact that with the developing techniques of manufacture large-scale, mass-production plants became more efficient than small ones. Producers expanded their plants in order to lower their costs and enhance their profits. The rise of machine techniques of production and the development of factory routines involving extensive specialization of both labor and machines were the basis of the increasing economies of large-scale plants. Labor tasks could often be specialized and simplified and strategic machinery effectively employed only in quite large-scale plants. The pursuit of the economies of machine production and of labor and machine specialization was the principal factor in the rise of mass-production firms.

The vertical integration of firms performing successive steps in an industrial process was another phase of industrial concentration, and was in part motivated by the technical economies which such integration offered. Successive manufacturing processes could often be carried on more effectively in a single plant than in a succession of independent plants. In steel making, for example, integration of blast furnace, steel converter, steel furnace, and rolling operations into a single plant made possible the avoidance of the loss of heat entailed when the pig iron or steel ingots were cooled for shipment between separate plants, and led to considerable savings in fuel cost. Furthermore, placing several successive operations under a single control made possible the co-ordination of interdependent production schedules, and also eliminated marketing

costs. Technological development was thus the basis both of integration and of growth of industrial plants.

The merger movement

The rise of large-scale firms was accompanied in the seventies and eighties by the emergence of particularly severe competition. In part this was evidence of the fact that new, large-scale plants were driving smaller and less efficient rivals from business. In many industries, moreover, general expansion of facilities led to a temporary surplus of capacity, and therefore to competitive price cutting among large rival firms. Competition was intensified by the continuing growth of the railroad systems, which tended to bring all of the principal firms together in direct competition for a single national market. The economy was passing from a situation where a fairly large number of small manufacturers sold their products, each in a limited local market somewhat protected by high costs of transportation, to a situation where a few large firms vied among themselves for sales in a single market. In the new environment, price competition was potentially ruinous to all.

As this tendency developed, the competing firms in many industries sought to avoid the ravages of unrestricted price rivalry by forming combinations or mergers. Slowly between 1879 and 1896, much more rapidly from 1897 to 1904, and again more slowly thereafter, there developed a merger movement of major proportions. The usual merger combined several firms in an industry into a single corporation or holding company, after which it closed down inefficient plants, expanded others, and sometimes effected various types of vertical integration. In a few industries a single firm gained a virtual monopoly of its field, but in most cases the result of combinations was to place a fairly high proportion of the capacity of an industry under the control of a single firm and to concentrate much of the remainder in the hands of a few large rivals.²

The scope of the merger movement was so great that by 1904 it had basically altered the structure of American industry. By the beginning of that year there were over three hundred large industrial combinations, with a combined capitalization in excess of \$7,000,000,000. They controlled more than two-fifths of the manufacturing capital of the country

² The largest combine in point of capitalization was the United States Steel Corporation, capitalized for \$1,370,000,000, which merged most of the important iron mines and iron and steel manufacturing facilities in the country. Other prominent combinations were the Standard Oil Company, American Sugar Refining Company, Consolidated Tobacco Company, American Smelting and Refining Company, and the United Shoe Machinery Company. Of the 92 largest combinations in 1904 (of the 318 then listed), 78 controlled 50 per cent or more of their industries, 57 controlled 60 per cent or more, and 26 controlled 80 per cent or more. (Moody, *The Truth About the Trusts*, pp. 485-487.) For a general discussion of the combination movement, see Seager and Gulick, *Trust and Corporation Problems*, pp. 49-71. New York: Harper & Brothers, 1929.

and had affected about four-fifths of important American industries. Since 1904 mergers have occurred less frequently, principally because the outstanding opportunities for mergers had already been rather fully exploited. During the 1920's, however, a number of mergers were effected in new industries like the automobile, radio, and moving picture industries. The combination movement, particularly that part of it occurring up to 1904, was the climactic phase in the development of concentration in American markets. Once it was accomplished, the previous pattern of competition gave way to the complicated rivalry of gigantic industrial estates.

The rationale of industrial combination

The motivating forces in the combination movement were in part technological. Many mergers enabled the combining firms to achieve further economies of large-scale production and of vertical integration. But the rise of highly concentrated industry must be explained also in other terms. The most evident of these further motives for combination was the desire to eliminate or control competition. The rivalry of a relatively small number of large firms in a national market was seen in the latter part of the nineteenth century to be potentially of such a character as to destroy profits for all. The combination of a firm with the stronger of its potential competitors was an obvious means of protecting profits. Although the stage for combination was thus set by the technologically induced rise of large-scale firms, combination itself had a more complex rationale.

A strategic concomitant of industrial mergers was the rise of the large corporation and of the holding company. The formation of the ten, fifty, or hundred-million-dollar enterprises which resulted from many combinations required the amassing of large amounts of funds, and the right of incorporation made this necessary financing relatively easy. The legalization in several states of holding companies (corporations formed to acquire the stock of several other corporations) likewise greatly facilitated the combination of existing firms. The new large firms and mergers typically took the form of corporations and holding companies. With the rise of incorporated industry, moreover, a financial community including the New York stock market, stock-brokers, and investment bankers acting as middlemen in selling corporate securities assumed a position of dominant importance in the American economy. Not only were the services of this financial community required in most combinations, but also, bankers or financiers often took the lead in the promotion of mergers. Since the commissions received by investment bankers and other financiers for the flotation of combinations were often very large, it seems probable that their pursuit of financial profit was at least a contributing cause of the formation of many mergers.

Certain aspects of the American legal system are also significant in the explanation of the merger movement. The Federal patent law, as judicially construed, grants to inventors the exclusive right for 17 years to make, sell, lease, license, or confine to absolute disuse any useful, original invention, and these rights are acquired in full by a business firm purchasing a patent. In certain industries the acquisition by one or a few firms of a group of patent rights covering strategic industrial processes enabled them to exclude competitors for a considerable period, and to establish firmly a monopolistic or highly concentrated control of their industries.³ Protective tariff laws also provided a favorable climate for combination. The exclusion of low-priced foreign goods from the American market occasionally made it possible for domestic combinations to raise or control prices, and thereby offered an additional motive to combination. Finally the Federal anti-trust law, as embodied principally in the Sherman Act, contributed somewhat paradoxically to the formation of mergers. The act, passed in 1890, specifically forbade loose agreements, cartels, or pools among independent firms but, as construed during the periods of most intense merger activity, did not seem to outlaw the actual merger or combination of firms up to a point somewhat short of complete monopoly. This construction of the Sherman Act seems definitely to have induced firms to *combine* with their competitors rather than to agree with them to limit competition. In countries where no such law was in force, cartels were more frequent, and outright combinations less common.

The fact that strategic resources furnishing their raw materials were located in limited areas within the national boundaries was a contributing factor to integration and combination in certain industries. In some of these instances one or a few firms gained virtual control of all desirable resources and, as a result, were able to build upon them integrated and combined firms dominating their fields. A final factor conditioning the development of integration and large size in American industry was the tremendous extent of the American market, protected always by distance from foreign sources of supply and often by tariffs. Effective exploitation of such a market implied the development of firms selling on a national scale and in many cases also the acquisition by manufacturers of integrated facilities for distribution. Distributive integration, oriented more toward the protection of profit than to the pursuit of low costs, was thus a final phase of the movement to concentration.

The American combination movement, although it was indeed an orderly phase in the evolution of industrialism, was thus considerably more than an adaptation of market structure to technological change

³ See Temporary National Economic Committee, Monograph No. 31: Walton Hamilton, *Patents and Free Enterprise*, Washington, D. C., 1941.

in pursuit of the greatest economies of production. Combinations were formed by private enterprises in order to increase or protect their profits. They accomplished this in a degree by reducing their costs, but also by maintaining or raising their prices, controlling competition, excluding potential competitors from access to resources or to industrial techniques, and availing themselves of the possibilities of nationwide sales promotion. Their ability to do so depended not only on the potential economies of combination, but also on the availability of the corporate form of organization, the existing framework of law, and the geography of markets and resources. Distinctions between "good" and "bad" combinations that turn upon the question of whether they were intended to economize or monopolize are idle. Mergers in general had a multiple motivation and were productive of a multiplicity of results. Whatever the subjective intent of the promoters may have been in individual cases, the general effect was to create highly concentrated markets in the heart of American industry.

Evolution of industrial price and market behavior

As the typical industrial market came to be dominated by a few very large corporate firms, certain significant changes appeared in the competitive behavior of the economy. The initial changes were transitional in character. In the formative years of many mergers, ruthless tactics were employed to drive remaining competitors out of business or to harass them so as to induce them to sell out to the combinations. The rise of the old Standard Oil Company, for example, to a position where it controlled about 85 per cent of the American petroleum industry was greatly facilitated by secret agreements with railroads whereby the Company received substantial rebates not only on its own shipments of oil but also on those of its competitors and by local price cutting designed to drive small competitors out of business.⁴ The Consolidated Tobacco Company, a combine which controlled 90 per cent of the American tobacco industry, was alleged to have resorted to predatory price cutting, to the imitation of competitors' brands, and to inducing boycotts by jobbers and dealers of its competitors' products, all as a means of forcing competitors to sell out to the combination.

Mergers which gained virtual control of their industries in some cases abruptly raised their prices and proceeded to reap unusually large profits at the expense of buyers. This phase had largely passed by 1920. In interpreting the Sherman Act, the courts had frowned on predatory market tactics and on obviously exploitative pricing policies, but had shown tolerance of better behaved combinations. At any rate the jungle war-

⁴ See Ida M. Tarbell, *History of the Standard Oil Company*, 2 vols. New York: The Macmillan Company, 1925.

fare stage of combination had passed, and predatory competition was no longer in order.

The more lasting changes in behavior involved a reduction in the importance of price competition and a growing emphasis on competition through product differentiation, advertising, and other types of sales promotion rather than on price competition. Large firms in concentrated industries were not at the mercy of a market price, and were able to quote their prices and to establish long-term pricing policies. They found it futile to engage in price rivalry with equally strong competitors, and avoided it as a means of securing custom. Avoidance of price competition was implemented in a number of ways. The firms of some industries tacitly recognized the strongest member firm as a "price leader," and changed prices only in unison and in accordance with the price changes of the leader. Many industries formed trade associations through which trade information was exchanged, selling policies were standardized, and prices were filed for the inspection of all members. Secret or semi-secret agreements concerning price, output, and market territories were not infrequently made. Some of these techniques for the limitation of price competition were found illegal under the Sherman Act, but the desire to avoid unrestricted price rivalry was so deeply seated that the basic behavior was not much altered by sporadic anti-trust prosecutions. Competition in terms of price by no means vanished, but free-moving and uncontrolled market prices become rare.⁵

The restriction of price competition was compensated for by a growing emphasis on non-price competition. Product improvement, mere product variation, extensive advertising, and direct selling became, during the 1920's, the accepted modes of soliciting custom. Concerns tended to establish a conventional price, and then to vie for the market by competitive expenditures on sales promotion. This was still competition, but a distinctly different sort of competition. The shift in competitive behavior was accompanied by the rise of new business ethics which justified it. "Live and let live" was the keynote of the emergent philosophy regarding competition, and it was accompanied by censure for the cut-price producer and praise for the "fair" competitor.

Social and economic consequences of industrial concentration

The manner in which the functioning of the economy was altered by these changes in competitive behavior cannot be precisely ascertained in all respects. Certain distinct developments are evident. Industrial prices after the merger movement were relatively inflexible in many cases;

⁵ See Gardiner Means, *Industrial Prices and Their Relative Inflexibility*, Senate Document, 13, 74th Congress, First Session, for an early discussion of the changes in the character of competition.

they were changed infrequently and fluctuated much less over the course of business cycles than did agricultural prices. As these prices were controlled by the policies of large firms, they may have become less persistent regulators of the rates of economic activity. The amount of expenditure on and the proportion of resources invested in product development, advertising, and sales promotion increased considerably. The effect of non-price competition on cost and price was often masked by a reduction of production costs due to increasing efficiency. In a virtual sense, in so far as the greater productive efficiency did not result from advertising and sales promotion, non-price competition led to higher costs and higher prices. Prices were established far enough above costs in most industries to yield relatively high profits in the 1920's, and again in the comparatively prosperous years of the later 1930's. With the concentration of industrial control, freedom of enterprise for the small investor was greatly reduced. Small capital could purchase corporate securities but found difficulty in establishing independent firms in most industries. Employers diminished in number, and employees increased.

The most evident changes were that the control of much of the nation's industries had become centered in the hands of a few large firms—less than 600 of them controlled over 50 per cent of corporate wealth in 1935—and that their competitive behavior was of a different sort than that observed in the later nineteenth century.⁶ Whether the economy functioned less efficiently because of this concentration, whether consumers paid too much for their goods, and whether labor received enough were controverted issues not susceptible of easy resolution. The economy had become much more productive while it was becoming concentrated. In what degree this increase in productivity was due to concentration, and in what degree in spite of it, was an unsettled question.

Some writers refer to the development from 1887 to the present as a "decline" of competition.⁷ There is no question that the whole structure of the economy, and the associated pattern of competitive behavior, underwent a basic change during this period. The term "decline," however, is perhaps unfortunate. There is still much rivalry for custom apparent in most American markets. It is of a character which does not emphasize price rivalry, and it may be productive of unique market results, but it is competition. Comparison with the behavior typical of the period from 1870 to 1890 is perhaps misleading. Although price competition—even price wars—typified the earlier interval, all this was certainly transitional in character, and must be viewed as a passing phase in the evolution of concentrated markets. Competition did not decline; it developed and

⁶ See Berle and Means, *The Modern Corporation and Private Property*, Book I. New York: Commerce Clearing House, Inc., 1932.

⁷ See A. R. Burns, *The Decline of Competition* (New York: McGraw-Hill Book Company, Inc., 1936) for the development of this point of view.

changed. Except in periods of rapid transition, private enterprise has shown a tendency to limit, to regulate, or to eliminate price competition, and to confine rivalry to its milder forms. This is implicit in the pursuit of profit. The history of the merger movement and its results in modern market structure and behavior are primary evidence of this tendency.

The Sherman Act and the Enforcement of Competition

Prior to the merger movement, the basic policy of the Federal Government toward industry was one of *laissez faire*. The right of private individuals to own and control personal goods, productive facilities, and resources was an integral part of the basic American law, and it was accepted as a matter of course that economic activity would be conducted by profit-seeking private enterprises. Upon the activities of private enterprise, a minimum of Governmental restriction was imposed. Acceptance of this policy of "hands-off" by the Government rested not only on the philosophy of individual liberty, but also on the generally accepted belief that competition among private enterprises would provide an adequate sort of automatic regulation that would ordinarily redound to the benefit of all.

This belief and the policy based upon it survived the merger movement and indeed survive today. Specific regulations limiting particular aspects of private business activity, like labor policies of employers and credit policies of banks, have become increasingly numerous. Except as an emergency expedient, however, no general alternative to the automatic regulation provided by competition has been tried in the United States. *Laissez faire* is still the basic principle, albeit a principle to which more and more exceptions are made.

This basic reliance on competition is reflected in the fact that the chief general type of regulation of industry has consisted of the attempt to maintain or enforce competition among business enterprises. The attempt is represented principally in the so-called anti-trust legislation of the Federal Government—in the Sherman Act, and less importantly in the Clayton Act and the Federal Trade Commission Act. The enforcement of these laws has constituted the main line of industrial regulation in America for the past half century. They were originated in the early phases of the merger movement and reflected the misgivings of certain groups concerning the effects on competition of the rapid rise of industrial combinations. As enforced, they have brought before the Federal courts instances of the evolving pattern of modern competition and have given the courts the opportunity to decide whether this new variety of competition has satisfactorily fulfilled its social function. Because competition has been a flexible and changing concept, however, no fixed standard of adequately competitive behavior has been developed. Because the legal conception of competition is narrower than the eco-

monic, enforcement of anti-trust legislation has turned more on the observance of the form of the law than on the socio-economic consequences of market behavior. And because of lax enforcement at strategic times, the anti-trust policy has probably failed to attain even its limited potentialities. The history of anti-trust policy which follows is accordingly an account of the rather confused administrative and judicial attempts to maintain "competition" and forbid "monopoly" in an evolving free-enterprise economy where each of these conceptions was susceptible to a multitude of interpretations.

Political origins of the Sherman Act

The broad implications of the concentration movement for the structure and behavior of the American economy were not foreseen or appreciated by its early contemporaries. Nor does the general public in the seventies, eighties, and nineties seem to have been much concerned with the problem of trusts and monopolies. The early phases of the concentration movement, however, involving predatory competitive tactics of growing firms and the experimental formation of competition-limiting agreements and pools in industries in the process of concentration did draw the censure of two groups—small businessmen, who were injured by predatory tactics, and farmers. The concern of the former over the growth of great combinations was a matter of direct self-interest, whereas for the agrarian group, opposition to combinations was a facet of a political program featuring opposition to high railroad rates, opposition to the protective tariff on industrial goods, and the advocacy of inflationary monetary reforms. Industry and agriculture were clearly divided on these principal issues; the farm group's opposition to "monopolistic" big business was a rather incidental aspect of its political enmity for the industrial group.

Nevertheless, the agitation of these directly interested groups was sufficient to induce 21 states, mostly in the South and Middle West, to pass statutory or constitutional prohibitions of "monopoly" and of agreements "in restraint of trade" by 1890. In practice these laws did little more than to reaffirm prevailing common-law doctrines against monopolization and restraint, since the laws of a single state could seldom impede the activity of a combination operating on a national scale but incorporated in some state with more lenient laws. The principal result of the state anti-trust laws was a series of judicial decisions that outlawed the voting trust as a means of combination and, therefore, encouraged business to seek legally circumspect methods of accomplishing the same end.

The passage by Congress of the Sherman Act as a Federal anti-trust statute in 1890 was apparently a minor measure of appeasement to the farm group. The presidential campaign of 1888 had been fought on the

tariff issue, and it was a Congress primarily preoccupied with protective tariff legislation (opposed by farmers) which passed the Sherman Act almost unanimously and with little debate. It was not passed in response to a noticeable clamor by any considerable group in or out of Congress for action with respect to combinations and for the time being principally served to put Congress on record as opposed to monopoly as it probably was also to sin and the common cold. Yet it was this act with its very inauspicious beginnings which served for the ensuing fifty years as the principal basis for Federal regulation of monopoly, combination, and the restriction of competition.

The inadequacy of early anti-trust enforcement: 1890-1905

The substantive provisions of the Sherman Act are simple and general, declaring illegal "every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States," territories, or districts and declaring guilty of a misdemeanor "every person who shall monopolize, or attempt to monopolize, or combine or conspire . . . to monopolize any part of the trade or commerce among the several States." The act provided fines and imprisonments for violations of its provisions, allowed private damages to injured parties, and invested the Attorney General with the duty of enforcement by litigation in the courts through bringing either criminal proceedings or proceedings in equity. The Federal courts were given jurisdiction over enforcement procedures. Because of its very general phrasing, leaving the way open for multiple interpretations of the ideas of "restraint" and "monopolization," and because enforcement was to be through case-by-case litigation in the courts, the act was in many senses a blank check written jointly to the Attorney General and to the courts. Each Attorney General could bring such actions as he saw fit, and the courts in each action could define the crucial concepts of restraint and monopolization in accordance with their ideas of the proper meaning of these terms. In a broad sense the act was perhaps a congressional affirmation of the desirability of preserving a competitive economy, but in a more specific sense it was a prohibition of certain overt actions the legal definition of which was to be developed by the courts when and as litigations were brought before them.

In view both of the character of the act and of the lack of widespread interest in its enforcement, it is not astonishing that in the first 15 years of its history it was almost unused. From 1891 through 1905 only 22 cases were brought under it, of which only 18 concerned industrial combinations. As a consequence it was not until the end of this period that the scope of the application of the act had been made sufficiently clear by the courts for either businessmen or the Attorney General

to know what, in fact, it did prohibit. The cases which were decided discouraged the formation of pools and agreements, but, since they placed no clear ban on mergers, by the same token they really encouraged the formation of mergers as an apparently lawful expedient. In the first important case decided (*U. S. vs. E. C. Knight Co.*, 1895), the court, in fact, declined to apply the act to a monopolistic combination in sugar refining on the narrow ground that monopolization of manufacture was not monopolization of commerce. Although the American Sugar Refining Company had acquired control of the stock of four competing Pennsylvania sugar refineries and thereby substantial domination of the production of sugar in the United States, the Supreme Court found that since Congress under the Constitution had power only to regulate commerce among the several States, and since combinations which directly monopolized manufacture only *indirectly* monopolized commerce, no "direct" violation of the act had been committed. From then until 1905 several agreements in restraint of competition among independent firms were found illegal, but it was not until 1904 (*Northern Securities Co. vs. U. S.*) that it was made clear that the act applied to restraints promulgated through property transfers, as in mergers, and specifically to mergers formed through the widely used holding company device.⁸ It was only gradually thereafter that it became clear that the dictum of the *Knight* case was being abandoned and that the courts would apply the act to monopolization of manufacture. Thus not until 1905 was the ground cleared for the application of the anti-trust law to the widely prevalent combinations.

During the most active phase of the merger movement, therefore, from 1897 to 1904, the Sherman Act lay idle and unused. Although more than three hundred large combinations were being formed, litigations were brought against practically none of them. The scanty judicial precedent which was available as a guide to business, moreover, offered no positive discouragement to merger activity, and even seemed to imply that actual combination might be a lawful alternative to cartelization as a means of limiting competition. The history of the act during this early merger period is strategic to an understanding of its later ineffectiveness. It was a result partially of this early inactivity, that when the act was seriously applied, mergers had become *faits accomplis*. When interest in enforcing the law was awakened, the enforcement agency and the courts faced the problem not of preventing pending mergers, but of deciding whether to dissolve well-established combinations. The infinitely greater difficulty of the latter task precluded the possibility that

⁸ The Northern Securities Company, a holding company, had acquired control of the stocks of the Great Northern and Northern Pacific railroads, competing lines. The court found that there was an illegal combination in restraint of interstate commerce and that holding companies formed under state corporation laws were in no wise thereby exempt from the prohibitions of the Sherman Act.

the Sherman Act would have any major influence on concentration in American industry.

"Trust-busting" under the Sherman Act—1906-1920

The Roosevelt administration which took office in 1905 had made a campaign issue of "trust-busting"—dissolution of monopolistic mergers—and was the first administration committed to a vigorous prosecution of the then 15-year-old Sherman Act. Public interest in its enforcement was rallied in the election campaign. Moderately active enforcement of the act was accordingly begun in 1906 and was carried on in the succeeding Taft and Wilson administrations. Thirty-seven cases were brought under the Roosevelt regime, 43 under Taft, and 53 in the first Wilson administration. Although many of these were minor cases involving restraining agreements, most of the major cases of the era from 1905 to the close of the First World War were concerned with the attempt to dissolve existing mergers which seemed to monopolize their respective industries.

The total effects of these prosecutions on the structure of American industry and on the character of competition was not very great. A few prominent mergers were indeed found in violation of the Sherman Act and were dissolved—notably the original Standard Oil Company, which had practically monopolized the refining of petroleum, and the Consolidated Tobacco Company, which occupied a similar position in tobacco manufacture. In a succession of cases decided at the conclusion of the First World War, however, it became clear that the Court would dissolve established mergers only in exceptional circumstances. In the critical cases of *U. S. vs. United Shoe Machinery Co.* (1918) and *U. S. vs. United States Steel Corporation* (1920) the courts found that a merger controlling all or a substantial proportion of an industry was not in violation of the Sherman Act provided that it was not currently either harassing or agreeing with its remaining rivals and that it was not currently exacting "monopolistic" prices. Size alone was no offense, and past sins were forgiven if current market behavior seemed orderly.

The judicial attitude which underlay these decisions was one of relative unconcern with the problem of industrial concentration as such or with its implications for the character of competition, but of preoccupation with the techniques of monopolization and market control. The adverse decisions in the Oil and Tobacco cases turned strongly on the evidence of oppression of competitors, predatory pricing tactics, and "intent" to monopolize by the combinations in question. In the later cases where the Court found no violation, the combinations in question had long since abandoned predatory tactics and were following a "live and let live" policy with remaining competitors. The court declared that these combinations were neither monopolizing nor restraining trade,

and the modified sort of competition characteristic of highly concentrated industries constituted in the eyes of the Court no violation of the Sherman Act. The legal conception of monopoly, in short, included situations involving specific overt actions of large firms but took little cognizance of the alteration of the character and effectiveness of market rivalry which accompanied the concentration of industrial markets.

The courts showed no disposition, therefore, to apply the penalties of the Sherman Act to the already typical American case of a highly concentrated industry, the ruthless tactics of whose member firms were in the past, their purpose having been accomplished, and the market behavior of whose members evidenced some limited degree of rivalry. Concentration was accepted as a *fait accompli*; further concentration was not discouraged, but trusts were admonished perhaps to avoid predatory tactics and to stop short of complete single-firm monopoly. After 1920, therefore, few cases were brought to dissolve mergers. The Sherman Act had lain idle when it might have been employed to prevent concentration; it now became evident that it could not be used to dissolve most well-established combinations.

Although the meager results of anti-merger enforcement of the Sherman Act were attributable principally to the judicial construction of the law, there were other factors contributing to its inefficacy. By the time merger cases were brought to trial in any number, most combinations had been established for 20 or 30 years; their stock issues represented widely held investment values; and dissolution would have been quite disruptive of economic activity. In a number of industries, combination furthermore rested on patent control and licensing, and these combinations, because of the inclusiveness of the patent right, appeared to be immune to prohibitions of the Sherman Act. The prosecution of cases by the office of the Attorney General, moreover, often evidenced a narrow interpretation of the act. "Technical violations" involving injury to competitors and restrictions of the freedom to compete were emphasized more than change in the character of competition and pricing. In cases like *U. S. vs. Standard Oil*, where relief was granted by the courts, the remedies proposed by the prosecution altered only the surface appearance of the industry, and took few of the steps essential to the real revival of competition. When the Standard Oil Company was ordered dissolved by the court, for example, it was directed that the shares of each of the 33 constituent corporations whose stock had been held by this holding company be distributed *pro-rata* to each of the stockholders of the holding company. As a result the group of men who had held majority control in Standard Oil retained individual control of each of its member firms, and the "co-operation" of these members was not immediately impaired. Finally, the original phrasing of the act was such that it was poorly adapted to the real regulation of market structure and

competition. This together with the timing of its enforcement, its narrow interpretation by the enforcement agency and by the courts, and the espousal of an economic philosophy which found little amiss in the competitive behavior of concentrated markets, contributed to the manner in which mergers fared under the Sherman Act.⁹

The prosecution of agreements in restraint of trade— 1921-1932

Most actions brought under the Sherman Act after 1920 accordingly were directed not against mergers but against restraints of trade arising out of agreements among independent competitors designed to limit competition. The courts from the outset had not hesitated to declare such agreements unlawful regardless of the reasonableness of their results, and had found violations of the act in the leading cases of *Ad-dyston Pipe and Steel Co. vs. U. S.* (1899), *Swift & Co. vs. U. S.* (1905), and others prior to 1910. Prosecution under the act of collusion in restraint of competition was potentially fruitful even if mergers were relatively immune, since the limitation of competition in concentrated industries was commonly implemented by explicit or implied agreements concerning output or price, by exchange of information through trade associations, and by tacit acceptance of price leadership.

In the three Republican administrations from 1921 through 1932 (after which the Sherman Act was temporarily suspended) an average of 14 cases per year were brought under the anti-trust laws. The decisions of the courts in the leading cases of this period substantiated their previous stand against agreements restraining competition. In *American Column & Lumber Co. vs. U. S.* (1921), *U. S. vs. American Linseed Oil Co.* (1923), *Maple Floor Manufacturers Association vs. U. S.* (1925), *U. S. vs. Trenton Potteries* (1927), and other cases the courts maintained the attitude that any collusive agreement either fixing price or having the substantial effect of fixing price was illegal regardless of the intent of the agreeing parties and regardless of the reasonableness of the prices fixed. The same prohibition apparently applied to agreements to limit output or to share the market. Mere failure to compete actively, exchange of information, and price leadership, however, if unsupported by agreements, were in general found not to constitute violation.¹⁰

The courts thus adhered to the practice of finding violation of the act in overt actions of competitors rather than in the character of price and

⁹ See Seager and Gulick, *Trust and Corporation Problems*, for a discussion of the leading merger cases under the Sherman Act.

¹⁰ See Temporary National Economic Committee, Monograph No. 38: Milton Handler, *Construction and Enforcement of the Federal Anti-Trust Laws*, Washington, D. C., 1941.

competitive behavior. Their definition of violations was nevertheless sufficiently broad and unequivocal to give considerable scope to the application of the law in the form of policing the competitive practices of concentrated industry. In spite of this, the effect of the Sherman Act on industrial behavior was slight in the period from 1921 through 1932. A pattern of privately regulated and restricted competition became increasingly evident throughout the 1920's.

The ineffectiveness of the act during this period was perhaps in part attributable to a lack of vigorous enforcement. The administrations of the 1920's were in general sympathetic with the aims and policies of big business, and the Attorneys General were consequently indisposed toward widespread anti-trust litigations. Consistently prosperous business conditions seemed to imply that interference with an efficient system was unnecessary. As a result, the number of cases brought was so small in relation to the probable number of violations that at the most the enforcement agency could make a few "examples" and hope that the other 99 per cent of violators would take the hint. Violators faced the possibility but not the probability of prosecution. Those prosecutions which were undertaken, moreover, were not designed to cast fear into potential miscreants under the act. The usual penalty for firms found in violation was that they would enter into consent decrees with the Government revising their practices to bring them into technical accord with its provisions. Substantial financial or other penalties were not likely to result from an anti-trust prosecution. Finally, the cases brought were usually designed to eliminate technical violation of the act rather than to effect any substantial revision in market price and competition. Attention was focused rather on the means by which business behavior was implemented than on the character of the behavior itself.

Although the temper and scope of enforcement in the 1920's hampered the development of whatever potentialities the Sherman Act may have had, it was by no means certain that even a more vigorous enforcement would have had much effect on the character of competition. The extent to which the pattern of restrained competition had to depend on the employment of collusive agreements is not known, nor is it known whether the natural tendency to collusive action could have been checked by any enforcement of the Sherman Act.

The revival of Sherman Act enforcement: 1937

From 1933 to 1935, the operation of the Sherman Act was largely suspended by the National Industrial Recovery Act, while under the N.R.A. industries were requested to form private cartels to be approved and enforced by the Government. Many of these cartels limited output, set prices, and otherwise restricted competition. Adoption of the

N.R.A. plan not only reflected the latent desire of concentrated business to limit competition further, but also a growing general belief arising out of the prolonged depression from 1929 to 1933 that competition was unworkable and should be replaced by centralized planning either by private business or by Government. There was at least temporarily an abandonment of that basic faith in competition as a regulator of the economy of which the Sherman Act was the principal representative. Economic opinion in the post-N.R.A. period continued to regard enforcement of the Sherman Act as futile, while business interests desired its repeal or modification in order to allow closer co-operation and greater restriction of competition.

In this light the revival of the Sherman Act in 1937 with a program of vigorous enforcement was surprising. Its renaissance seems attributable less to any basic philosophies of the Roosevelt New Deal than to the personality of a newcomer to the administration, Thurman W. Arnold, who took charge of the anti-trust division of the Justice Department in the second Roosevelt administration. With a background in the legal profession, with his roots in the liberal and agricultural West, but with a highly sophisticated appreciation of the intricate working of markets dominated by large-scale corporate enterprise, Arnold undertook anti-trust enforcement with an attitude which was unique in the history of the Sherman Act.

The aim of the Arnold program was to increase substantially the degree of competition and correspondingly to reduce prices, through elimination of "private seizure" of the control of markets or private control of competition. Enforcement was to be in the public interest and was to emphasize greater over-all production of the necessities of life rather than mere technical compliance with the provisions of the act. The basic tenet of the program was that restraints of trade tended to emerge naturally in most industries and therefore required continual policing. The Sherman Act was like a traffic speed law in that nearly everyone tended to violate it and in that widespread and continued enforcement was necessary to insure compliance. Compliance, it was felt, would increase price competition and thus in turn would lead to greater employment and production. The program itself was accordingly one of very numerous litigations under the act, directed against strategic industries (and simultaneously against various parts of the same industry), and oriented primarily to the revision of price and other market behavior regarded as socially undesirable. Prosecutions were primarily against collusive agreements, and no general attempt to disintegrate established combinations was proposed. This program was accompanied by the recommendation of revision in patent and fair trade laws which sponsored collusive agreements legally exempt from the provisions of the Sherman Act. These changes in the traditional

policy of Sherman Act enforcement, it was argued, would greatly enhance its effectiveness.¹¹

Thus for the first time in its 50-year history the Sherman Act, traditional legal symbol of faith in competition and in *laissez faire*, was realistically brought to bear on the problem of enforcing competition. In 1940, the first year of the expanded program, 85 cases were instituted under the anti-trust law. The cases were brought against industries producing goods important in the cost of living, and were oriented toward substantially revising competitive behavior. The potentialities of the Arnold program, interrupted shortly after its inception by the advent of war in 1941, are not yet clear. The high proportion of convictions obtained by Arnold in the many cases brought before the courts substantiate the claim that restraints of trade are very numerous and can be reached only through an expanded enforcement program. It is not clear from available evidence, however, whether restraints can be really eliminated by such enforcement, or whether, if they are eliminated, competitive behavior will be much revised. In an economy where there was a growing belief that unregulated competition was of a socially unsatisfactory character, the Arnold program offered the principal alternative to some scheme of centralized regulation.

The Federal Trade Commission and the Clayton Act

The Sherman Act has since 1890 been the cornerstone of the Government policy of anti-trust regulation and enforcement of competition. The policy was elaborated and implemented in a degree in 1914 with the establishment of the Federal Trade Commission and with the passage of the Clayton Anti-trust Act. The Commission was established as an administrative body to investigate the competitive practices of business and to request their revision in certain cases, without instituting litigations except as a last resort. The Clayton Act was intended to supplement the Sherman Act by filling certain loopholes left in it by judicial interpretation. Because of weak original construction and of subsequent judicial interpretation, neither of these supplements to the basic anti-trust policy has added much to the substantial regulation of competition in the United States.

The substantive provisions of the Clayton Act made illegal certain specific business practices which had been employed in eliminating competitors, limiting competition, and forming combinations, but which were not forbidden under the prevailing interpretation of the Sherman Act. Price discrimination among buyers was forbidden; exclusive selling

¹¹ The philosophy of the Arnold enforcement policy, as well as his critique of past anti-trust enforcement, is developed in Arnold's *Bottlenecks of Business*, New York: Reynal and Hitchcock, Inc., 1940.

or leasing contracts on patented or unpatented articles were made illegal; intercorporate stock acquisitions were proscribed. All of these prohibitions applied only, however, where the effect was substantially to lessen competition or to tend to create monopoly. In addition certain limitations on interlocking directorates among competing companies were provided, and it was specifically stated that labor unions were not *per se* combinations in restraint of trade. The newly established Federal Trade Commission was charged with the enforcement of the act through the issuance of cease and desist orders, backed by reference to the circuit courts. Litigation under the act could also be brought into the district courts by the Attorney General.

The Federal Trade Commission Act established a commission of five appointive members. It was empowered to make investigations of firms and industries and recommendations based thereon, in co-operation with the President, Congress, and the Attorney General. Its only regulative powers were to enforce the substantive provisions of the Clayton Act and to "prevent unfair methods of competition." This it could accomplish only by the issuance of cease and desist orders, which could be appealed to the circuit courts either by the Commission or by those affected by the orders.

The Clayton Act never became an important weapon in the anti-trust arsenal. Dealing only with a few specific practices among the many available to business, and handicapped by the flexible proviso that these were illegal only where they substantially lessened competition or fostered monopoly, it was foredoomed to emasculation through strict judicial interpretation. The conservative minority in the Congress which passed it attacked it as a weakening of the Sherman Act and as a concession to the vested interests. In subsequent cases involving intercompany stock acquisitions, the courts nullified that section of the act by holding that intercompany acquisition of assets was a legal alternative to stock acquisition, and that mergers which had acquired the assets of the combining firms at the time proceedings were instituted were not in violation of the act even if stock acquisition had been undertaken as an initial step. The provision forbidding price discrimination was construed so as to apply only to discrimination aimed at a competitor of the discriminator, a fairly rare occurrence. The provision regarding tying contracts was also narrowly construed in leading cases. After a number of cases in which substantial control even over the practices specified could not be obtained by the Commission, interest in the Clayton Act lapsed. It has become a virtually dead letter as far as public control of competition is concerned, and is of interest principally as the basis for private litigations among businessmen. Its ineffectiveness may be attributed jointly to weak original con-

struction, inadequate procedural remedies, and very conservative judicial interpretation.

The significant activities of the Federal Trade Commission, therefore, came to center largely around its remaining powers—to make investigations and to prevent unfair methods of competition through the use of a cease-and-desist procedure. Its investigations were often well conducted, and its recommendations to Congress in some instances influenced the drafting of legislation applying to specific industries. Positive action under the power to prevent unfair methods of competition, as time passed, resolved itself principally into action to maintain an ethical “plane of competition” by proceeding against misbranding and misrepresentation. Numerous actions of this character designed to maintain the morals of businessmen for the protection of both their competitors and consumers have been undertaken to some public advantage. The emphasis, however, was neither on the enforcement of competition nor on its restriction, but rather on the establishment of the ethical level on which business rivalry might take place. As such, it was not a vital part of the public policy toward monopoly and competition. Certain actions have been taken by the Commission from time to time against collusive agreements, over which it shares jurisdiction with the Sherman Act as enforced by the Department of Justice. Since the latter authority is stronger and carries the threat of the real penalties provided by the Sherman Act, it has continued to be the principal source of positive action in the regulation of competition.

The ineffectiveness of the Clayton Act resulted from weak construction and strict interpretation. The minor contribution of the Federal Trade Commission to the substantial regulation of competitive behavior was due to the failure in practice of the Wilsonian liberal idea that adequate publicity on industrial behavior would lead rapidly to its revision either voluntarily or by law, and to the fact that the Commission was given only limited substantive powers other than those of investigation and publicity. Positive action to prevent restrictions on competition, therefore, reverted again to the enforcement of the Sherman Act by litigation in the courts.

Conclusion

The anti-trust policy since its inception in 1890 may be viewed as an adjunct to the basic policy of *laissez faire*; its ostensible aim has been to preserve the conditions under which competition would serve as an adequate regulator of economic activity. In the accomplishment of this aim it has had to rely on the prohibition of what the courts and the Attorneys General chose to regard as monopolization and restraint of trade. On the whole its influence on competitive behavior has not

been great; it has not retarded very much the development of concentrated market structures favorable to the limitation of competition, and it has been able to influence the price and market policies of concentrated industries only indirectly through the prohibition of collusive agreements and of certain market tactics. Its ineffectiveness has been attributable principally to the absence of any generally accepted economic standard of an adequate or desirable form or degree of competition, and this lack has in turn been attributable both to the vagueness of the idea of competition and to the rapidly evolving character of market rivalry during the period of its enforcement. Absence of an accepted economic standard has usually been complemented by the existence of a legal standard which emphasized the maintenance of a freedom to compete rather than the observance of some particular degree or form of competition. Whatever potentialities the approach employed may have had, moreover, were largely unrealized because of a lack of widespread and vigorous enforcement in the general public interest.

Opinions as to the merits of the anti-trust policy vary widely. One position is that the Sherman Act has been inherently incapable of preserving adequate competition and should be replaced by a more stringent governmental control. Another is that it has stood unfortunately in the way of a full cartelization of business, and should be abandoned in favor of a system of centralized private planning by industries. Yet another is that modern competition as traditionally regulated is still a very adequate controller of economic activity, and should be allowed to follow its present course. The Arnold position is that lax enforcement of the Sherman Act has allowed undesirable limitations of competition to develop, but that a vigorous enforcement may eliminate these restrictions and revive competition. The relative merits of these positions, in the light not only of economic but also of political expediency have been and will be leading public issues in a peacetime America. A clear resolution of the problem lies in the realms of political philosophy and of extended economic analysis.

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CHAPTER 31

Business Organization and Management

Introduction

BUSINESS MANAGEMENT may be defined as the deciding upon and carrying out within a unit of business organization of policies designed to result in a maximum profit to the owners of the enterprise.¹ This objective is achieved by utilizing the so-called factors of production: land, labor, and capital. The business may take the form of a corporation, partnership, or individual proprietorship, depending upon various factors such as taxes, publicity, the need for capital, or the desire for limited liability.

From a survey of the changing scene of American economic development from the War Between the States to the present, two conclusions can be drawn. First is the fact that throughout these years there have been alternate periods of "sellers' markets" and "buyers' markets." In some years the products of American business have been very easy to sell because of general prosperity and rising demand, while conversely there have been times when goods were difficult to get rid of at profitable prices. Naturally, these situations were reflected in the varying policies of business management. The second conclusion is that, despite these alternating trends, fundamental changes have been taking place in the economic, social, and political background of the American scene. German writers call these "structural changes" or "Strukturwandlungen"; they have had important repercussions upon the decisions of business management. One of the most important of the recent changes, for example, has been the steady trend since the 1860's toward greater and greater Government intervention in the affairs of business. Another is the decline in the rate of growth of the population in the United States. Reference will be made to these two types of changes as the discussion progresses.

Business Management and the War Between the States

Until recently it was fashionable to regard the War Between the States as the end of one era and the beginning of another in American

¹ There may, of course, be other goals in business besides maximum profits, such as prestige for owners or management, enlarged size, maximum employment, reputation of product, and so forth, but in most cases profits are certainly the main consideration.

economic development, but today there is a growing feeling that such a generalization is not strictly accurate. Many of the trends that proved so important during and after the war had their start in the years before 1860, especially in the fifties. Some of these trends were the decline in the costs of transportation brought about by the development of canals and railroads, the increase in the output of manufactures, the growth of the factory and the use of machinery, the increasing popularity of the corporation in the fields of manufacturing and commerce, and finally the establishment of labor unions on a national scale.

Yet the quickening effect of the war years should not be minimized. Some important changes took place that were destined to make their influence felt in the post-war years. From the point of view of the businessman, the most important contribution of the war was its spurring of a tremendous increase in demand. It created a "sellers' market" in which selling problems gave way to the problem of producing enough to satisfy the great needs of private consumers plus the Government. Fortunately for business (and perhaps unfortunately for the interests of the nation as a whole) few if any attempts were made by the state to limit prices and profits or to restrict the demand of the general public. Inflation was left to run its course. The important immediate cause of the increased demand was, of course, the need of the Federal (and, in the South, of the Confederate) Government for war supplies. The manufacturers and distributors of textiles, shoes, and iron and steel products apparently benefited the most.² Another factor was the protective tariff and the extensive internal revenue duties that added to the price and profit rise. Furthermore, in the North the settlement of the West continued at a rapid pace and served to support business activity. Finally, the issuance of greenbacks added fuel to the already high flames of inflation. The net result of all these conditions was to assure a market to almost any business that could obtain capital, labor, and raw materials. The war with its demand for large quantities of standardized goods for the use of the armed forces also helped to hasten the trend toward large-scale machine industry. More and more businessmen became acquainted with the problems and potentialities of mass production.

A further result of the war that was to make its influence more strongly felt in the last quarter of the century was the rise of the magazine and especially the newspaper to satisfy the demand for war news. Their increased popularity was aided by the decline in publication expenses due to the invention of the curved stereotype plate and the use of the

² E. D. Fite, *Social and Industrial Conditions in the North During the Civil War*. New York: Macmillan, 1910.

cheaper wood pulp paper.³ People had become "news conscious." All that remained was for business to become aware of the possibilities of large-scale advertising.

Before 1860 there existed an increasing tendency to divide up the functions of business management among various specialists in transportation, wholesaling, retailing, insurance, banking, and so forth. In earlier times the average manufacturer very often undertook to perform these functions himself as a part of his job. The war undoubtedly accelerated this trend toward specialization through its emphasis upon production problems, through its contribution to the rapid growth in the geographic size of markets, the great expansion in demand itself, and the increased size of the typical business firm. All these factors encouraged greater concentration of the manager upon manufacturing or production problems and dependence upon the outsider to take care of marketing and financial problems. The day of the "merchant prince" and the "captain of industry" was declining.

Finally, an important and lasting effect of the war years was the establishment of close relations between business and Government. As always in wartime, the desire to procure lucrative Government contracts brought many businessmen to Washington. Closer contacts were also induced by the lobbying necessary to push through the protective tariffs of 1862 and 1864. The Government land grants and loans that were deemed so important for the construction of the transcontinental railroads exercised a beckoning influence. Last but not least, relations between the two groups were solidified by the rise to power of the businessman's political organization: the Republican Party.

The tradition of *laissez faire* was weakened by the war, greatly to the advantage of business enterprise. This change, too, had made its appearance before the war in the form of moderately protective tariffs, Government aid to transportation and banking, and restrictive regulation of public service and financial enterprises, but 1861 inaugurated a period of positive aid to business on a scale never before seen in this country.

The Impact of Depression upon Business Management

The 35 years between the end of the war in 1864 and the opening of the present century were vital years in the development of American business. In the first place, price trends until 1896 were distinctly downward, making profitable operations extremely difficult during many of these years. The problem was complicated by the greatly increasing production of manufactured goods during this period. In the second

³ F. Presbey, *The History and Development of Advertising*. New York: Doubleday, Doran & Co., 1929.

place, the long years of severe depression that punctuated the period added to the difficulties of a falling price trend and rising production. Two of the worst depressions in American history were ushered in with the panics of 1873 and 1893. In the third place, there arose out of the unstable economic situation an uncertain political condition. These were the years of the "revolt against big business" by farmers and laboring classes. Weighty financial questions were argued, including the matters of whether or not to pay war bond issues in gold, whether to resume specie payments or resort to bimetallism, whether to regulate railroads and break down monopolies or remain faithful to the principles of *laissez faire*. Such uncertainties probably had some effect upon the formulation of business policies.

Closer study of the situation will reveal that the effects of the depression years were particularly severe upon business because of the nature of American enterprise at this time. Markets in general were expanding their demands except during the years of most severe depression. Population was increasing at the rate of about 25 per cent a decade until 1890, and somewhat less thereafter. The costs of transportation were falling as the railroad network stretched across the country, and improved its service.⁴ Cutthroat competition among the various overbuilt lines brought down rates and developed markets still further. Meanwhile, the ocean steamship helped to cut the costs of exports. Yet business management, strangely enough, met these changes with divided feelings. The combination of declining prices and widening markets coupled with long periods of severe depression subjected individual firms to what appeared to be a ruinous type of competition. Competition was becoming nationwide, even worldwide, and no longer merely local in scope.

But it was especially the state of affairs within the structure of costs of production that served to make such competition ruinous. The war-speeded tendency toward mechanization and large-scale business placed greater importance on fixed expenses in the costs of operating a business. These fixed costs included depreciation on the important fixed assets of the factories, interest on the larger quantity of capital now needed, rent on the expanded plants, and salaries of a larger administrative staff of experts in production, record-keeping, and selling. When sales declined, as they frequently did because of depression or the influx of competing firms, these costs grew larger and larger when figured on a unit of output basis. At the same time, toward the end of the period the growing strength of labor unions made it more difficult than usual to cut expenses by reducing wages, at least in time to keep up with the

⁴ Between 1880 and 1890 some 70,000 miles of railways were constructed, a record never again reached in the United States.

decline of sales and income. The result was a race to secure by price-cutting as much of the declining market as possible. When indulged in by all, the effect was indeed ruinous and only made a bad matter worse. Such a situation had become common among the railroads with their fixed-costs structure even before 1860, but now as a result of the rise of mass production it had become all too common among industries in general. The question naturally arose: what could be done to restore profits?

It should be added that this period was by no means a period of continual depression; although two of America's worst sieges of bad business fell before 1900. In fact, there was considerable prosperity in the years 1869, 1871-73, 1879-82, 1887, 1889-90, and 1892.⁵ But the combination of a downward price trend and alternating periods of good and bad business certainly affected most business firms in the manner described above.

Attempts to Restore Profits in Depression

The first thought of business enterprise naturally was to place the price structure upon a profitable level again. Such efforts took two forms: the simple, time-tested remedy of control of supply (monopoly or duopoly) and the more complicated remedy of differentiation of product (monopolistic competition). Monopoly was attempted in those industries burdened with an especially high level of fixed costs such as the railroads, iron and steel mills, and mining companies. The relatively small number of competitors also aided such attempts in these and other industries such as petroleum and tobacco products. The result, which is well known to all followers of the trust problem, was a series of gentlemen's agreements, pools, trusts and outright mergers. In many other industries either bankruptcy overtook the weaker firms or the second method, product differentiation, was resorted to. The subject of monopolistic competition has drawn considerable attention from economic theorists in recent years and only a brief explanation is necessary.⁶ Among other things, it involves the use of brand names, trade marks, advertising, or special services in an effort to persuade the customer of the superiority of the products of the differentiating firm over those of its competitors. If successful, sales are bolstered or expanded at the expense of the firm employing less effective methods of differentiation or even none at all.

It has been shown above how events during the war years had served to encourage the use of the cheap daily or weekly periodical. The medium was there; now businessmen were beginning to appreciate its

⁵ See W. L. Thorpe, *Business Annals*, pp. 77-80, New York: National Bureau of Economic Research, 1926.

⁶ For a concise, elementary discussion of the problem see A. L. Meyers, *Elements of Modern Economics*, New York: Prentice-Hall, Inc., 1941.

value for their advertising in these years of expanding markets or of depression. The public actually seemed to like this new method of cut-throat competition, although it rather unlogically condemned the more naïve method of monopolistic cartels and trusts!

One other method of dealing with embarrassing competition was adopted: diversified production. Businessmen discovered that, particularly during times of depression when demand fell off, concentration upon the production or sale of only one item or a few related items could become very risky. They attempted to take their eggs out of the one basket and distribute them among many baskets by developing new products and sidelines. The experience of the Dennison Manufacturing Company in this respect is probably typical. This company began its activity with the manufacture of jewelers' boxes in 1844 and gradually branched out into the tag and label field. Competitive conditions after the war forced the company to expand still further by adding the cheaper grades of tags to their line and also by selling directly to the retailer when the wholesalers failed to push their products aggressively enough. The panicky conditions after 1873 found them resorting to lower price levels, still cheaper lines and more advertising, especially in the "family organs," such as the *Ladies Home Journal* and *Youth's Companion*. Later on, new styles of boxes and cases were brought out, as well as new items such as paper napkins, glue and paste, imported and domestic crepe paper. Introduction of crepe paper brought Dennison into the retail field in order to sell and demonstrate its materials designed for making paper products at home.⁷

The Bankers, the Corporation, and Business Management

Behind the rise and fall of business conditions changes were taking place that were destined to put a new face upon the American economic situation. One of these was the continued rise of the investment banker. Even before the war the average business enterprise had begun to turn to outside sources for its capital but the movement became more pronounced as big business rose to a more dominating position in American economic life. This was quite in conformance with the tendency described above of specialization in production, selling, transportation, and financial problems but the result was far-reaching, for in these years was laid the foundation for the much-condemned, much-discussed "banker control" of business. In other words, the investment banker was to become not a mere specializing servant of business enterprise, but sometimes a ruler of it.

A good case could have been made for intervention of the banker in

⁷ For a more detailed account of this interesting company see E. P. Hayes, "History of the Dennison Manufacturing Company," *Journal of Economic and Business History*, August, 1929, Vol. 1, No. 3, pp. 467-502, and C. Heath, article in the same magazine, November, 1929, Vol. 2, No. 1, pp. 163-202.

the problems of management. Presumably he possessed a broader knowledge and viewpoint gained through his contacts with many firms and entire industries in similar circumstances, in contrast to the narrow point of view of the management of a particular firm. Furthermore, a firm embarrassed by a temporary lack of cash could seek aid from its favorite banker without publicity or an examination of its financial affairs by numerous outside banking interests. The favorite banker could also gain great familiarity with the condition of his clients by means of exclusive access to records, and contacts with managing officers. From the point of view of the investor the rise of the investment banker assured a thorough examination of the securities before their sale, a tacit guarantee of their quality after sale, and a continued conservative influence by the banker upon the actions of management.

But to many observers the control exercised by the banker did not appear to be an unmixed blessing. There was too great a possibility of conflict among the interests of management, banker, security-holder, and the general public. It was possible for banker, management, and investor to profit from the monopolies so commonly created in the nineties by pools, trusts, and mergers, but they were hardly beneficial to the public interest. Desire for the profits and commissions of security sales often led bankers to advise the sale of unnecessary issues of stocks and bonds, leaving corporations overburdened with watered stock and excessive fixed charges from interest on bond issues. In this case, both the corporation and the security purchaser were harmed. Despite these disadvantages, criticism of the situation was slow to develop and the voices of famous critics such as Louis D. Brandeis and William Z. Ripley were to be heard only later as bankers' control became more widespread and conspicuous.⁸ The earliest examples of the misuse of big business powers appeared in the actions of men of the Wall Street speculator type, such as Jay Gould and Jim Fisk, rather than the banker specialist.⁹ Some of these men were railroad operators or entrepreneurs, some bankers, and others unscrupulous speculators. Fortunately they were a rare breed appearing largely as a result of the low level of business ethics in the years immediately following the War Between the States, and their places were eventually taken by more subtle if not less unscrupulous persons.

The rise of the investment banker to a key position in the business world tended to shift the emphasis on personalities from the businessman who spent most of his time working on the management problems of his

⁸ The earlier critics tended to condemn the capitalistic system in general, rather than the actions of the bankers alone. See, for example, E. Bellamy, *Looking Backward, 2000-1887* (Boston: Houghton, 1888); and H. D. Lloyd, *Wealth Against Commonwealth* (New York: Harper, 1894).

⁹ See F. C. Hicks, ed., *High Finance in the Sixties*. New Haven: Yale University Press, 1929.

own firm to the banker who had a controlling hand in the affairs of many companies. Without a doubt, the leader of this new race of business moguls was the much-maligned, much-praised John Pierpont Morgan. The story of his accomplishments is told elsewhere, but it should be stressed here that he received his early training in an environment of banking in a time when foreign exchange was one of the chief interests of bankers. Like that of other bankers his interest in foreign exchange expanded into U. S. and foreign government financing and finally into private industry, beginning with the railroads, the chief consumers of the nation's savings in those years. In order to be sure that his "suggestions" were adopted Morgan was forced to take over the control of reorganized railroads by means of the voting trust. By the close of the century the capital needs of the manufacturing industries began to press for attention, and this situation, together with the dangers of cutthroat competition, drew the attention of Morgan to this field, so that manufacturing firms controlled by Morgan soon began to make their appearance.¹⁰ His example of banking service coupled with control was soon followed by other bankers, and a new era had begun in the field of business management.

The appearance of the investment banker was closely accompanied by the growing popularity of the corporation as a form of business organization. There is considerable evidence that the corporation was being used more and more, especially in the 1850's, by business enterprise outside of the field of public service industries (railroads, turnpikes, bridges, and so forth) and of banking and finance. After the war, however, there developed not only an increased demand on the part of business enterprise for such an institution but also a greater tendency on the part of Government to grant its use. New circumstances increased the need for the corporation. Business firms were becoming larger in volume of output, number of workers employed, and, most significant, capital needs. In such industries as iron and steel, textiles, mining, chemicals, liquor, and nonferrous metals, the proprietorship and the partnership proved inadequate means of obtaining the large amount of capital needed by these gigantic mechanized firms. Other and less important attractions offered by the corporation probably included its permanence as a legal entity separate from the stockholder-owners; the limited liability of the owners, which facilitated the widespread sale of stock; the ease of administration arising out of the separation of investment from management, so that persons with

¹⁰ For a careful appraisal of Morgan's work in the railroad field see: E. G. Campbell, *The Reorganization of the American Railroad System, 1893-1900*. New York: Columbia University Press, 1938. General biographies of Morgan are less satisfactory although interesting: J. Winkler, *Morgan, the Magnificent* (New York: Garden City Press, 1930); and L. Corey, *The House of Morgan* (New York: G. H. Watt, 1930).

managerial ability and no capital could join forces with persons with capital and little managerial ability. Large firms were also able to decentralize administration by setting up subsidiary companies with separate managing staffs and even stockholders, over which the parent companies could retain control by reserving substantial blocks of stock. This arrangement also permitted combinations aimed at reducing costs or building up monopolistic control. All of the advantages bestowed by the corporation were especially appealing during a period when capital needs were expanding and competition becoming keener.

But the needs of business would have had an indecisive effect had they not been strengthened by a public opinion favorably disposed toward the corporation. Here again, even before 1860, the old hostility toward the corporation as monopolistic and special privileged showed signs of weakening. More and more special acts of incorporation were passed for a growing variety of purposes, and some states even resorted to general incorporation laws in order to relieve the burden of their legislatures and "equalize" opportunities of firms to incorporate. But it was during and after the War Between the States that corporations really began to appear in large numbers.¹¹ Furthermore, the movement toward incorporation by general act became more widespread and, once the ball started rolling, other states were forced to fall in line or run the danger of losing revenue derived from the granting of charters and watch the migration of capital to states less strict.

The softening attitude toward the corporation thus took two lines of development: The first was a continuing expansion of incorporation by general act instead of by special legislation for each charter. The new system was considered more democratic because it opened up incorporation to all on equal terms. A hardly less important feature of general incorporation law was the relief from congestion¹² and attempted corruption that it afforded a hard-pressed legislature. The second concession to business was a general lowering of the standards of corporation law. These standards seem to have remained fairly high until about the last decade of the century, when the combined needs of business for the corporation and of the state for revenue after long years of depression soon produced a sweeping change in the hitherto rigorous attitude of the state governments. As is well known, the first state to weaken was New Jersey. This state had introduced a limited form of general incorporation as early as 1849, but incorporation by special act continued until prohibited by a constitutional amendment in

¹¹ The experience of Vermont may have been typical: the largest number of firms incorporated by special act in any single year before the war was 42 in the boom year of 1836. In 1865 58 corporations were created and in 1870, 66, and so on.

¹² For example: Maine in one year (1836) issued 150 separate charters in contrast to an annual average of 16 in the period 1820-1860.

1875.¹³ In 1888 a radical departure allowed New Jersey corporations to hold stock in other corporations, a privilege that until then had been permitted by any state only under special circumstances. This move made New Jersey a popular state with companies participating in the trust movement, but apparently it was not yet enough, for in 1896 New Jersey companies were expressly granted the right to do business anywhere, incorporation taxes were greatly reduced, and amendments to articles of association by majority vote were made easier. After about 1890 the movement toward easing corporation laws spread to other states, partly as a measure of self-defense, partly as a means of increasing revenue.

The "Corporation Problem" Appears

The basic problem of the corporation in modern economic life has been succinctly defined by Professor Wright as follows:

The corporation problem may be said to consist in the need for devising a form of business organization suited to meet the wants of modern large-scale enterprise with the specialization of functions that this requires, which will at the same time provide adequate safeguards to protect all the different groups of interests concerned. At present the chief evils have arisen from the failure to provide such safeguards.¹⁴

Such safeguards had probably been lacking to some degree before the last quarter of the twentieth century, but at no previous time had the demand for incorporation been so insistent and widespread and the state so anxious to satisfy it. Incorporation had ceased to be looked upon by grantor and grantee as a special privilege and had come to be regarded almost as a right. Not only did this change in view weaken the protection set up for investor, worker, and general public: the corporation became a vehicle for monopoly and unfair competition. But at the same time it was making possible mechanization and mass production that, with the natural wealth of the country, became the basis of the famous American standard of living.

Meantime a definite break occurred in the relations between business management and the public. The combination of two serious depressions, a falling price level (especially for agricultural products), and the abuse of powers of monopoly by railroads and manufacturing interests raised a public uproar. The situation was not at all improved by the tactics used by business leaders to break strikes, nor by the growing influence of business in Washington and the various state capitals, nor by the general indifference of some businessmen toward public

¹³ H. W. Stoke, "Economic Influences upon the Corporation Laws of New Jersey," *Journal of Political Economy*, October, 1930, Vol. 38, No. 5, pp. 551-579.

¹⁴ Chester W. Wright, *Economic History of the United States*, p. 673. New York: McGraw-Hill Book Co., 1941.

relations as expressed by William H. Vanderbilt's famous "The public be damned." The public reaction was to reach its climax later in the anti-trust drives of Presidents Roosevelt, Taft, and Wilson. Perhaps only the price rise and the improvement in economic conditions after 1896 saved American business from a New Deal then and deferred its appearance until another time of somewhat similar conditions.

The Period of Steady, Slow Growth: 1900-1913

The years from the opening of the century to 1913 were a period of quiet growth unmarked by serious and complicated problems in manufacturing and marketing. In fact, some observers are prone to call this a period of that elusive "normalcy" so often described and so seldom realized. Prices rose steadily, markets and sales (both domestic and foreign) expanded, and only one serious depression, in 1907-1908, marred the scene but only for a relatively short time. From the point of view of business management the only serious problems were the growing power of organized labor, the "trust-busting" activities of the Federal Government, and a growing intensity of non-price competition.

But many leaders began to realize that in addition to these problems large-scale business brought with it the disadvantage of absence of personal contacts and incentives that were present in the days of smaller business units. A problem of immediate importance in those years was how to manage big business with the greatest amount of efficiency and the least amount of red tape. A vital part of this problem was management's relations with labor. Rising wages and a greater use of expensive capital equipment per worker made labor a key figure in manufacturing industry. The result was the scientific-management movement fathered by F. W. Taylor and limited at first to the technical problems of production but expanded later to form the basis of better business management as a whole. Scientific management originally undertook studies designed to test the operations used by workers and devised new ones to take their places if the old ones proved inefficient. Out of this process grew personnel administration intended to improve relations between management and labor by trying to restore something of the personal element that had formerly existed, by seeing to it that the worker was given the job best suited to his abilities, and by improving working conditions in general. On the whole, however, only the foundations of the personnel-administration movement were laid during these years and it gathered greater momentum during the World War years and after than at this time.

In the sphere of office management, scientific management was aided by the development of better accounting methods, greater accuracy in keeping of records by means of the card index, and a tendency toward organization of business more and more on a departmentalized or staff

basis whereby specialists in various fields were set up in their own departments with their own staffs to aid the enterprise as a whole. Many firms soon had entire departments with managers devoted to accounting and auditing, buying and selling, warehousing, advertising, or handling personnel problems. Specialists outside the firm set themselves up in business to act in consulting capacity. Mechanized methods also invaded business administration led, of course, in these early years by the typewriter. It became recognized, furthermore, that business management might benefit from rationalized study in higher education just like any other subject, and university schools of business presently began to make their appearance.

Another problem faced by business management was the growing power of organized labor. Unsuccessful strikes and the severe depressions toward the end of the nineteenth century left the American labor movement quite weakened and pretty much at the mercy of the employers. About this time, however, the founding of the American Federation of Labor based upon a new set of principles brought some gain to organized labor, and after a period of slow growth the membership of the Federation rose rapidly from 272,000 members in 1897 to 1,676,000 in 1904. A more radical group, the I. W. W., also expanded, but it remained weaker although more vociferous. As living costs and membership in labor unions rose, numerous strikes occurred, the most serious being the anthracite coal strike of 1902. As a result of these events business management began to organize itself into powerful bodies designed to present a united front to labor, the most important being the National Metal Trades Association formed in 1899, and the National Association of Manufacturers founded in 1895. Both were increasingly active up to 1913.

As a matter of fact, the activities of trade associations were not confined to labor relations nor even to trust-building or monopolistic matters. Beginning in the eighties of the past century and especially after 1900, American businessmen showed a greater and greater desire to co-operate with each other in affairs of mutual interest. Perhaps the main reason for this trend was that business problems were fast getting beyond the ability of the average firm to solve; besides, the tactics of such organizations in restricting prices and production before the more rigid enforcement of the antitrust laws probably pointed the way to the advantages of such co-operation in more legal and innocuous fields. Such co-operative undertakings included joint research and advertising, patent pools, joint insurance, and similar programs.¹⁵ During the next period (1914-1929) such bodies became even more numerous under the stimulus of wartime conditions.

¹⁵ See *Trade Associations, Their Economic Significance and Legal Status*. New York: National Industrial Conference Board, 1925.

A final problem was that of marketing the product of business enterprise. Under the stress of depression conditions and increasing competition more and more business firms in the last quarter of the nineteenth century found themselves forced either to resort to some form of monopoly or to concentrate upon other aspects of the product they were selling besides price. Consequently, since outright monopoly was frowned upon by public opinion this period witnessed a great expansion in advertising. In contrast to previous years, the methods became more refined and subtle. Photographs and colored pictures were used in the increasing number of magazines available.¹⁶ Whether this type of competition was of benefit to the consumer or not is, of course, a moot question. It could be said that it resulted merely in a shifting of demand from one advertiser to another. On the other hand, it could be regarded as being highly informative to the consumer and as stimulating the seller to keep up with his competitors.¹⁷ Whatever the influence of advertising was during these years, it is certainly true that the rise of the practice coincided with a rapid growth of production goods and services in the United States and a consequent rise in the standard of living.

The First World War

In wartime the first effects of conflict usually are not clear and they vary from industry to industry. As a war continues confusion gives way to unfavorable trends that apply with equal intensity to all business. As far as the American effort was concerned, the First World War was too short for this second stage to develop to an appreciable degree. The chief effects upon the decisions of business management seem to have been in the field of labor relations and in the costs structure.

Employers were almost immediately faced with a rise in labor costs together with a rise in the costs of raw materials. The change in raw material costs, however, was of significance chiefly to those firms that were tied down by custom, consumer resistance, or Governmental regulation to more or less rigid prices for their products. Railroads, public utilities, and to a less extent manufacturers of consumers' goods, were the chief sufferers in this respect. Firms that were combined vertically (from raw material to finished product) probably were able to avoid buying in the higher-priced, open market so that the war tended to encourage such combinations. But there remained the problem of the unions and the progress they were making in organizing workers and extending the closed shop, as well as securing a shorter basic working day. Membership in labor unions began to rise at a rapid rate in 1915 until a record high was reached in the early post-war years (1920:

¹⁶ See Presbey, *The History and Development of Advertising*.

¹⁷ For a recent detailed study of the subject see N. H. Borden, *The Economic Effects of Advertising*. Chicago: Irwin, 1942.

5,047,000).¹⁸ For a time rising costs were absorbed by many industries through the high prices of wartime inflation¹⁹ and a real encounter with the unions was postponed until after the war.

Certainly business benefited greatly from the flood of Government orders arising out of the war and from the fact that price regulation was so long postponed and so ineffective.²⁰ Furthermore, the war, as always, performed the function of a protective tariff which barred competitive products from the belligerents of both sides: the unfriendly powers for obvious reasons and the friendly because of their preoccupation with the war. New markets that had been the preserves of the warring nations were found, especially in Latin America. Finally, owing to the non-enforcement of the antitrust laws and because of advantages to business and Government alike, combinations, both horizontal and vertical, were greatly encouraged. Membership in the looser trade associations expanded with the need for co-operation among business firms in obtaining Government contracts and fulfilling Governmental regulations.²¹

From the First World War to the 1929 Crash

The increased productivity of American industry during the war years proved to be a source of difficulty for business management for many years following 1918. Surpluses built up during the war had to be disposed of and the brief but severe reaction of 1920-1921 was in part caused by attempts to solve this problem. A buyers' market had again taken over. Yet it is easy to exaggerate the extent of increased production in wartime. Much of the "increase" is merely a substitution of certain products at the expense of others (especially consumers' goods) that are poorly represented in the index of industrial production. The search for new markets after 1918 was chiefly the result of long years of developing mechanization of industry. Of course, just as did the War Between the States, the World War showed business management new practices of production to satisfy the large Governmental demands, and in later years these mass-production methods were applied to peacetime products. The most sensational example of this process was the motor-car industry with its assembly line. Among other industries putting wartime methods to peacetime use were the chemical and office-machinery companies. Nonetheless, the war really hastened and expanded a development that had its roots further back in American economic

¹⁸ L. Wolman, *Ebb and Flow in Trade Unions*, p. 16. New York: National Bureau of Economic Research, 1936.

¹⁹ Wholesale prices rose from 98 in 1914 to 214 in 1918 and a peak of 231 in 1920. (1910-1914 = 100).

²⁰ The Governmental price-control program did not take form until the summer of 1917. See C. O. Hardy, *Wartime Control of Prices*, p. 121. Washington: The Brookings Institution, 1940.

²¹ See H. R. Seager and C. A. Gulick, *Trust and Corporation Problems*, p. 306. New York: Harper & Bros., 1929.

progress. A similar situation, in fact, arose in the other industrialized nations of the Western world.

Three outstanding solutions were tried out by business management in the attempt to sell surplus output. First, more efficient methods of commodity distribution were adopted to maintain pace with production. The department store, mail-order house, and chain store all had their beginnings in the second half of the nineteenth century but it was in the years after 1918 that the mail-order house and especially the chain store expanded most rapidly. Montgomery Ward, Sears Roebuck, A. & P. and other firms became household words in the United States and they helped to sell the flood of goods from the mechanized plants through their mass buying power, their efficient store management, and their convenient outlets in town and country. The growing use of the motor car and truck, together with the emphasis these firms placed upon low price policies helped in this development.

The second method designed to rescue business from drowning in its own production was directed at mass consumption: advertising coupled with product differentiation. Lowered printing costs, the use of color, the great popularity of the weekly magazine and, more recently, the use of the radio, gave business an opportunity to develop the mass market based on high turnover at a small profit per unit. Unfortunately, in depression years there was a tendency for this method to backfire in the growing doubts among formerly docile consumers as to the value of advertising. But so long as business remained at a high level, the word of advertising was the law.

A final method of rescuing business from the troubles of the buyers' market was the time-honored attempt to reduce production costs by means of vertical and horizontal combinations. The fervor of the nineties was repeated on a smaller scale with the difference that the emphasis was directed away from the desire for monopoly price and toward reduced costs and efficiency. This changed emphasis was probably quite sincere on the part of business management: business had learned to appreciate the value of favorable public opinion. Probably, also, monopoly-price situations were more difficult to attain. This new movement toward combination differed from the old also in that consumers' goods industries were featured more than heavy or capital goods industries. The appearance of General Foods, Standard Brands, National Dairy Products, Borden's, and Drug, Inc., on the business scene illustrate this. Other important mergers took place in the motor-car, baked-goods, gasoline, tire, and radio industries.

Partly as a result of these efforts and partly as a consequence of a fairly stable if not a rising price level, growing export markets, a *laissez-faire* attitude on the part of Government, and other favorable develop-

ments, the growing product of American industry was sold at profitable prices. At least, for a time!

Labor Problems

During this period the problem of labor relations seemed easily settled. Although the American Federation of Labor membership reached a record high of over 4,000,000 by 1920, its roster declined rapidly in the years following. The most important reasons for this waning strength include a rather natural reaction from the rapid wartime growth plus stable living costs after 1921 that robbed the unions of one of their prime functions: to maintain or raise real wages. The decline of the labor unions gave employers a chance to take over the labor movement in part and to make up for their inactivity during the war, especially since wages tended to remain at wartime levels and prices had tumbled sharply in 1921. Now as never before management felt an interest in employees' welfare because of the high investment in capital goods per worker resulting from the widespread mechanization of industry. The temptation to reduce labor turnover and to build a staff of satisfied workers was very strong. For these purposes "welfare capitalism" was born. It brought many services of benefit to the worker: housing, medical services, and recreational facilities. But it also meant the temporary crippling of an independent labor movement. Unions and employees not attracted toward welfare capitalism were attacked by the company unions or by the time-proved injunctions issued by friendly judges. Total membership in labor unions fell to about 3,400,000 in 1929.²²

Relations to Government

From the point of view of business, there was little cause for complaint about its relations to the Federal Government during this period. The Republican party dominated the Federal and most of the state administrations, the highly protective tariff was re-introduced shortly after the war and appeared to be well established, despite the objections of a few hundred economists. For a while, to some observers the era of good feeling even seemed to extend to the antitrust laws. Cartels were permitted in the export trade by the Webb Act of 1918, while in 1920 under the Transportation Act railroads were allowed to indulge in the formerly reprehensible practice of pooling (under supervision of the Interstate Commerce Commission). The newly established Federal Trade Commission seemed to concentrate its efforts upon relatively minor "unfair methods" of competition. In fact, the Commission was authorized under

²² Wolman, *Ebb and Flow in Trade Unions*.

the law itself to protect business firms from each other rather than to intervene for the protection of the consumer. Even the Supreme Court seemed to have taken on an attitude favorable to big business in its United States Steel decision of 1920. Whether these actions were justified economically or not, the fact remained that business management seemed to have little to fear from the antitrust laws. Even public opinion in general appeared to have accepted large-scale business. The American public seemed to believe that large units aided in stabilizing economic conditions, in smoothing out the business cycle, as well as in passing on the economies of mass production and distribution.

The Corporation

These years were also the golden age of the corporation. It was in this period that the corporation reached out from public utilities, banking, insurance, railroads (all within its original scope), and large-scale manufacturing into medium and even small-scale manufacturing and, most important, into distribution and trade. Although the corporation was not the strongest form of business organization in numbers, in 1929 it was responsible for almost 62 per cent of income produced (excluding Government).²³ Its share of wage earners employed in manufacturing rose from 70.6 per cent in 1904 to 89.9 per cent in 1929, and in mining and quarrying from 85 per cent to 94.7 per cent in the same years. In trade, its latest convert, over 60 per cent of income produced came from corporate activity.²⁴ Only in agriculture and building construction did the corporation fail to make much progress in this period.

The reasons for the widespread appeal of the corporation to business management are easy to ascertain. Since business was growing in size, the opportunity to raise capital through the sale of stocks and bonds began to appear advantageous even to those industries in which small size had formerly made the corporation unnecessary. In the case of small business in fields where the factor of risk was fairly high, the advantage of limited liability for debts seemed well worth-while. Added to this attraction was the great boom in the stock market which helped investment bankers to sell securities in expanding corporations or newly formed companies, while the promise of capital gains made a great hit with the man on the street who had made his first acquaintance with securities by his purchases of Liberty and Victory bonds during the First World War. Besides, the general attitude toward big business was favorable, so that it is not surprising that the corporation made great headway between 1918 and 1929.

Along with the corporation, the power of the banker also reached its

²³ See Twentieth Century Fund report on *Big Business: Its Growth and Its Place*, pp. 13-20. New York: 1937.

²⁴ *Big Business: Its Growth and Its Place*, p. 18.

peak in this period. This dominance of the banker was natural as long as there were new corporations to form and new securities to sell. Bankers became interested in the problems of business management, and business managers (unfortunately for many companies and investors) became interested in the problems and profits of banking. Even the commercial banks lost their traditional function of supplying short-term capital and sharply expanded their loans on securities and real estate. Indirectly they entered the investment security market by setting up affiliates to participate in bringing out new issues. The dominance of the banker has led some students of economic history to term this the period of "finance capitalism," or, because of the important part played by the corporation and the security markets, "security capitalism."

There was another aspect to the rise of the corporation besides banker-control and that was the change in relations between management and ownership in the corporation. Individual stockholders were being increasingly drawn from the group with small and moderate incomes, rather than from the wealthy classes.²⁵ Such persons not only had little knowledge about corporations and no desire to participate in their management: individually their stockholdings were too small to give them much control over the management. To be sure, such situations had existed earlier, even before 1860.²⁶ In 1912 a witness before the famous Pujo, or money trust, investigating committee admitted that he had never heard of a case in a large corporation in which common stockholders were able to remove the management, except when a large single block of stock was involved. But at the time of the Pujo investigation ownership of corporations was more widespread and the situation was not limited to a few industries such as the railroads and large manufacturing companies. Control of the large corporation was in the hands of bankers, leading officers, or a few stockholders with concentrated holdings,²⁷ with the result that the possibilities for misuse of power to the detriment of a large number of small stockholders were very great. The dangers of the situation first became apparent to most people after the depression years set in. As far as business management was concerned, this situation enabled it to raise vast amounts of capital for large-scale business and still hold control in its own hands with little danger of outside interference.

²⁵ See A. A. Berle, and G. C. Means, *The Modern Corporation and Private Property*, p. 60. New York: The Macmillan Co., 1934.

²⁶ Ownership in the large New England cotton mills was quite widespread before 1860. See C. Ware, *The Early New England Cotton Manufacture*, pp. 148-151. Boston: Houghton Mifflin, 1931.

²⁷ Only 11 per cent of the 200 largest nonfinancial corporations in the U. S. in 1930 were controlled by a single individual or a small group of individuals holding all or a majority of the outstanding stock. See Berle and Means, *The Modern Corporation and Private Property*, p. 94.

Depression and Reform

The years of 1929 to 1933 were just another period of depression as far as their effects upon the actions and problems of business management went. Just as in previous depressions, the economic risks of business were greatly intensified by rapidly falling prices, by lagging or "sticky" costs, and by the loss of foreign markets. The difficulties were probably made even worse than usual by the extremely violent and prolonged price decline of commodities, real estate, and securities, so that the effects upon the American banking structure were more serious than at any other time in the history of the United States (with the possible exception of the 1837 panic). In addition, many industries became more and more dependent during the twenties upon the export market, a tendency encouraged by the export of American capital to all corners of the world. Finally, the greatly expanded use of machinery meant that a larger proportion of the costs of production remained fixed, and unit costs rose as output tumbled.

The usual efforts were made to fight the depression and the losses or risk of losses accompanying it. Costs were lowered by wage cuts, by the introduction of labor-saving machinery, and by combinations. Products were diversified, and an effort was made to slow up the decline in sales by advertising. If nothing else helped, bankruptcy was resorted to. In the field of railroad transportation, an industry burdened as usual by fixed costs and almost fixed rates, some 30 per cent of the nation's mileage was in the hands of receivers.

But the most interesting and unique effect of the depression was the intensification of political risks. For the first time since the trust-busting episode, and reminiscent of Jackson's fight against big business in banking, business management was faced by an antagonistic administration in Washington that checked its activities with a New Deal undoubtedly backed up by public opinion. The New Deal philosophy toward business certainly had its source in the anger and resentment created by the effects of the depression upon dividendless stockholders and jobless workers. Perhaps the experience and remembrance of Government control of business during the First World War also exerted some remote influence, but much more important were the trends in business organization and management established in the years 1918 to 1929. These trends included the spread of large-scale business over almost all of the nation's economic structure, accompanied by the rise in power of the banker and financier at the same time that the "little man" lost his hold upon business management either as a direct participant, a security-holder, or an employee.

This is not the place to discuss all the reform measures introduced by the New Deal. It should be noted, however, that negatively viewed,

the New Deal constitutes a fundamental attack upon the allied powers of management and banking control of business in the United States. On the positive side should be placed its measures favoring the small businessman, the investor, and labor, such as the securities and exchange legislation, the National Labor Relations Act, the Robinson-Patman Act, and the Miller-Tydings Act. It is true that the legislation dealing with marketing and the restriction of the chain store was not specifically introduced nor supported by the New Deal, but there is little doubt that it was born in the same "anti-big-business" environment.

The Present Position of Business Management

At present there is a growing interest in the problems of business management. One reason for this is, of course, the desire to reduce costs and increase profits, and since the tasks of management have been greatly increased with the growth in size of the business unit and the market for its products, interest has continued to shift from the problems of production and distribution to the over-all problem of management. Such a situation has been in existence and has been intensified as management has become a more and more specialized function. But there is another reason of more recent origin: both businessmen and observers outside of business are now more aware than heretofore of the social implications of business management and administration. Undoubtedly, a few farsighted individuals saw these implications before 1929; but the years of depression from 1929 to 1933 and the advent of the New Deal brought home especially to business leaders the realization that their decisions in managing business firms affect not only the profits of business but the lives and welfare of its employees, its customers, and, most important, the interests of the public in general. For some time business management has been a subject of study by private interests; it is now recognized to be a social matter as well.

Study of business administration directed at possible improvement calls not merely for the mechanization of management through installation of business machines; it also entails the creation of better methods of organization. It undertakes even more: an analysis of the logic by which executive decisions are made and the general philosophy of business management. This phase of the study has led to a further interesting development. Many observers feel that the bureaucratic management of a large business enterprise and the management of a Government department or bureau have many problems in common. Not only would this theory imply similar studies for both; it might mean that socialism and capitalism of the present day are not such strange bedfellows after all! As a result of such developments, a host of studies of the management problem have recently been made public. For example, N. R. Danielian draws parallels between the management of the giant A. T.

& T. with that of a Government agency in his detailed study of the Telephone Company²⁸ while J. Burnham in his popular book²⁹ of a few years ago makes use of the comparison to point out alleged similarities between the business and the Government "manager." W. L. Thorp stresses the increasing responsibility for changes and innovations that Government is taking on and its effect upon the function of business management as an innovator.³⁰ The Temporary National Economic Committee in its report on the problems of bureaucracy, chiefly in the large business corporation, drew some comparison between management problems of business and Government.³¹ Finally, a recent and very able contribution on the subject of how management works was made by a business executive, Chester Barnard of the New Jersey Telephone and Telegraph Company.³²

The problems of business management will definitely attract a great deal of attention in the future as business management comes to feel itself more and more a trustee for the interests of consumer, employee, investor, and the general public. This is a far cry from the problems of business management in the days before 1861!

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²⁸ N. R. Danielian, A. T. & T. *The Story of Industrial Conquest*. New York: Vanguard Press, Inc., 1939.

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³⁰ W. L. Thorp, "The Role of Management as an Innovator," *Journal of Business*, Vol. 14, No. 4, pp. 42-61. University of Chicago.

³¹ M. E. Dimock, and H. K. Hyde, *Bureaucracy and Trusteeship in Large Corporations*, TNEC Monograph No. 11. Washington, D. C., 1940.

³² Chester I. Barnard, *The Functions of the Executive*. Cambridge, Mass.: Harvard University Press, 1938.

CHAPTER 32

The Performance of the American Economy Since 1860

IN THE PERIOD that has elapsed from the beginning of the War Between the States to the present time, the structure of the American economy has undergone a profound change, although the change was a gradual one and was not crucially influenced by the war itself. Not until some time later, in fact, did it become evident that American economic development had entered a new era in which manufacturing was beginning to make a greater contribution to national income than agriculture.¹ But the war probably hastened the movement by reducing the influence of the agricultural, low-tariff South. This internal change meant that a predominantly open, world-dependent, and relatively undeveloped economy had become a predominantly closed, self-sufficient, and intensively organized economy. The trend of the country's economic growth was fundamentally altered thereby and so was its performance in war and peace.

¹ The change in the relative importance of agriculture and manufacturing may be observed in Figure 1, which traces the percentage shares of these two industries in realized private production income. From 30.8 per cent for agriculture and 12.1 per cent for manufacturing in 1859, the proportions change to 12.3 per cent for agriculture and 30.3 per cent for manufacturing in 1937. (Robert F. Martin, *National Income in the United States, 1799-1938*, pp. 60-61. New York: National Industrial Conference Board, 1939.)

The declining relative importance of agriculture may be traced to the passing of the frontier—that is, the extensive frontier in terms of free land in the West. With the elimination of free land, the rate of growth of agriculture became stabilized and the drainage of labor and capital from the potential manufacturing areas of the East was reduced. This does not mean that agricultural development had reached a stationary condition. Intensive development took place, of course, and has continued to this day.

The changes in the field of manufacturing may be traced largely to the influence of the Industrial Revolution on the United States. The growth of population through immigration and natural increase created an enlarged market and increased the labor supply. Improvements in transportation, mainly in the building of trans-continental lines, increased the accessibility of the market and made the various sections of the economy more interdependent. These developments, together with improved financial and distribution facilities, made possible the extensive introduction of machine technology and mass production in manufacturing. Manufacturing contributed an increasing share of the national income, and it surpassed agriculture in income production even before the end of the nineteenth century. The number of persons employed in manufacturing exceeded that in agriculture somewhat later, because of the high labor productivity in mechanized factory production. These developments automatically meant a more self-sufficient economy.

Peacetime Crises and Cycles

In those parts of the period following the War Between the States in which this country was at peace, the economy showed evidence that it was maturing out of one cause of instability and into another. In the period before the war, economic crises had resulted mainly from a combination of frontier land

PERCENTAGE OF
REALIZED PRIVATE
PRODUCTION INCOME

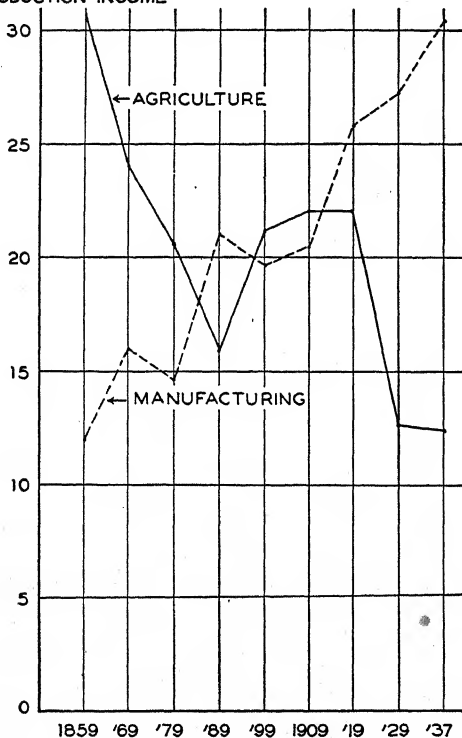


FIG. 1. Percentage Shares of Agriculture and Manufacturing in Realized Private Production Income, 1859-1937. Source of basic data: National Industrial Conference Board.

speculation and an inadequate and unreliable currency supply. These were a function of the rapid growth of the economy and found their origin largely in outside factors, such as agricultural conditions and wars. Now the speculation that took place was based on investment in plant and equipment, such as is involved in railroad building and the opening up of factories; the expansion was geared to the supply of deposit money rather than to that of currency. The country also now became more sensitive to internal, regional fluctuations as a national, interdependent economy grew up. Any change in one part of the country was felt in other parts sooner and more seriously than a decade before. The gradual

passing of the extensive or geographical frontier thus changed the type of problem but did not produce less serious problems.

The peacetime economic fluctuations in the era since the War Between the States fall into two periods, separated by the First World War. These extend roughly from 1869 to 1913 and from 1922 to 1939. In the first period there were the crises of 1873, 1884, 1893, 1903, and 1907. In the second period occurred the crash of 1929 and the recession of 1937. The latter part of the second period, from 1933 to 1939, was unique in the important role played by fiscal policy under peacetime conditions.

The crisis of 1873 and the period 1869-1879²

The factors leading up to the crisis of 1873 bear a strong resemblance to those surrounding the several crises of the pre-war period: financial disturbances precipitated the decline, and overinvestment (in railroads, now, instead of land) was the major weakness in the underlying situation. The crisis is frequently regarded as part of a postponed readjustment arising out of the War Between the States and its attendant inflationary disturbances.³ It is difficult, however, to discover disruptive forces that were created by the war and then lay dormant for nearly a decade before coming to the fore. Rather, the war interrupted the gathering railroad boom and thereby postponed the sharp reaction to be expected from the hectic financing and the overbuilding that had taken place. The behavior of prices and business activity during this period is portrayed in Figure 2.

The decade of favorable business conditions following the war was geared mainly to investment activity in the railroad industry, the financing of which was facilitated to some extent by considerable inflows of foreign capital. A general boom developed, but it carried with it the seeds of its own destruction. At that time the economy displayed two characteristics that have since lost their relative importance. First of all, the "marginal propensity to import" was high: an increase in national income resulted in greatly increased imports, since many desirable products, particularly luxuries, were of foreign manufacture. Second, the stability of the country's financial structure, both monetary and banking, was dependent on the supply of specie. The increased national income resulting from the railroad boom brought about an increase in imports and led to a capital outflow, in the form of gold. This loss contributed to a financial crisis, which broke in September, 1873. Although in looking back it is apparent that the breaking point was near, the panic when it actually occurred took the economy unawares.⁴

² See Willard L. Thorp, *Business Annals*, pp. 130-133 (New York: National Bureau of Economic Research, 1926); and O. M. W. Sprague, *History of Crises under the National Banking System*, pp. 1-107 (Washington: National Monetary Commission, Sen. Doc. No. 538, 1910).

³ See, for instance, *First Annual Report of the Commissioner of Labor, 1886: Industrial Depressions*, p. 60. Washington: Government Printing Office, 1886. The reader may also find interest in the section on "Causes of Depression as Elicited by Committees of Congress," pp. 61-63.

⁴ The signs of trouble were there nevertheless. "The crisis of 1873 did not come without loud warnings. In the two preceding years, at the autumn season, money was scarce and rates of interest were high. On the 2nd of October, 1871, bank reserves in New York city exceeded requirements by only \$3,666,943. On the 3rd of October, 1872, there was a deficiency in reserves of \$1,131,436. On the 28th of February, 1873, a deficiency appeared again, and, although there was an increase of reserves in June, rates of interest were high and displayed abnormal fluctuations." (Theodore E. Burton, *Financial Crises*, p. 288. New York and London: D. Appleton-Century Company, 1931.)

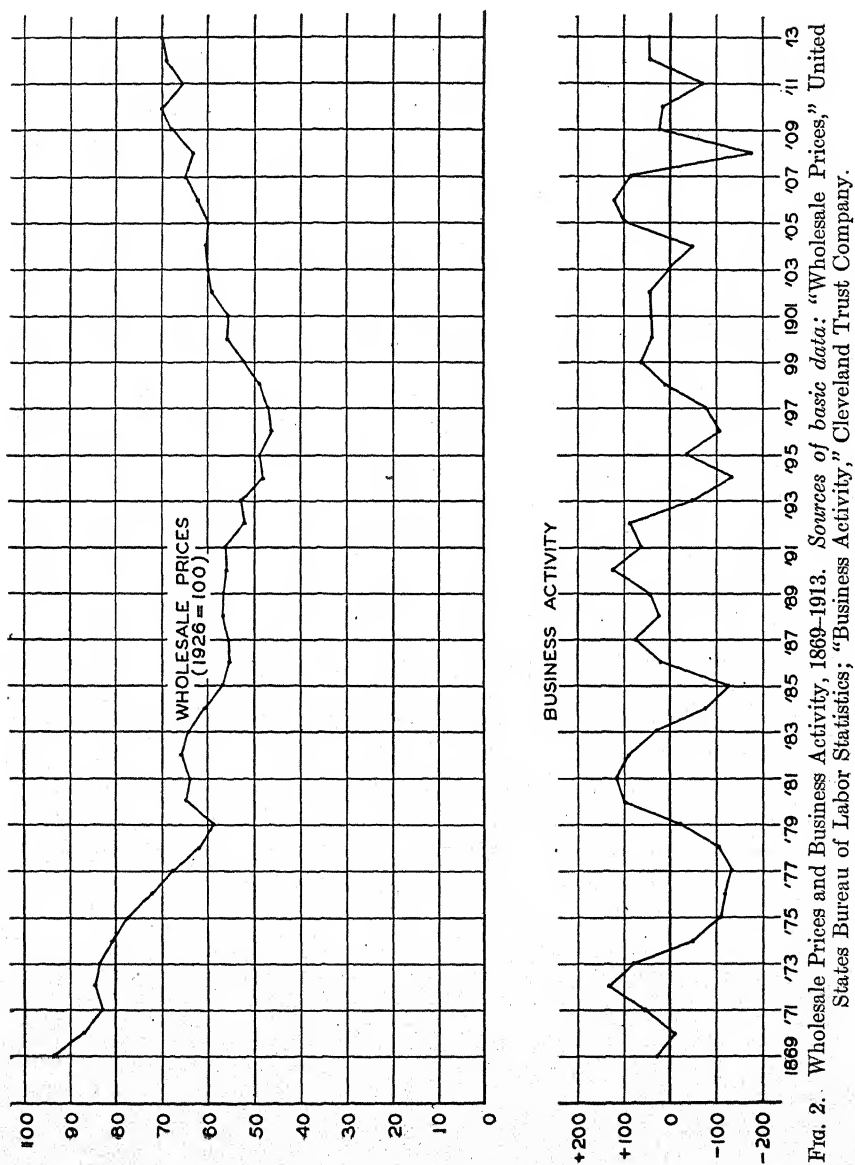


FIG. 2. Wholesale Prices and Business Activity, 1869-1913. Sources of basic data: "Wholesale Prices," United States Bureau of Labor Statistics; "Business Activity," Cleveland Trust Company.

The financial crisis, from rather small beginnings, soon spread throughout the economy. When the important Jay Cooke and Company failed as a result of its attempts to finance the Northern Pacific,⁵ bankers and brokers in general felt the pinch, and many went bankrupt. The New York Stock Exchange had to close its doors, and bank suspensions were widespread.⁶ Again the country's delicate financial structure had been set off-balance, with disruptive effects on the whole economy.

In the depression that followed the financial crisis, the only favorable developments lay in the financial sphere and in international trade. The financial situation soon improved, largely because of expansive Treasury measures. The developments in international trade consisted of the establishment of a "favorable" balance of commodity trade, which removed one cause of the gold outflow. This "favorable" balance was partly achieved, however, by a reduction of imports, and so cannot be regarded with unmixed approval. The decline in imports was a reflection of a downward revision of both domestic prices and national income, the elasticity of the demand with respect to price and income for imported goods having been very high. Hence, the decline in domestic prices relative to world prices, and the decline in national income accompanying the depressed state of business activity, reduced the demand for imported goods. At the same time, the relative price adjustments improved the position of the export industries and led to an increase in exports. The country as a whole was, however, in the depths of a business depression that lasted four years.

The recovery became noticeable toward the end of 1878, and the level of business improved during that year and the one following. The recovery may be traced largely to an exogenous factor—the coincidence of record wheat and corn crops here with European crop failures in 1879 and 1880. Agriculture prospered and expanded, and the increased exports led to gold imports, which facilitated the resumption of specie payments. Railroad building and general manufacturing were stimulated. The country entered upon a period of exhilarating prosperity.

The crisis of 1884 and the period 1879–1889⁷

The crisis of 1884 was an almost purely financial reaction with only minor repercussions on the economy as a whole. Again the hectic financing of the railroads was at the root of the difficulties. This, added to a series of business failures and a state of general uncertainty over

⁵ For a vivid description of the events surrounding this failure, see Charles A. Collman, *Our Mysterious Panics: 1830–1930*, pp. 98 ff. New York: William Morrow & Company, 1931. See also, "Panic in Wall Street," *Harper's Magazine*, Vol. 48, p. 128. New York: Harper and Brothers, 1874.

⁶ Collman, *Our Mysterious Panics*, pp. 103–107.

⁷ See Thorp, *Business Annals*, pp. 133–135; and Sprague, *History of Crises under the National Banking System*, pp. 108–123.

the country's ability to remain on the gold standard, tightened up the money and capital markets. The main feature of the brief depression period was the scarcity of funds on the money market,⁸ but it took only a few weeks for the financial crisis to pass, and the subsequent depression in general business activity lasted barely more than a year.

The recovery in business activity took place in the second half of 1885, and by 1887 the country was once again enjoying prosperity. Railroad building was resumed and led to a renewal of speculation in Western land, a buying movement that was accentuated by the increasing scarcity of undeveloped areas. The heavy industries that were geared to railroad expansion, particularly iron and steel, also boomed, and manufacturing and agriculture were favorably affected.

The crisis of 1893 and the period 1889-1899⁹

Once more, in the crisis of 1893, monetary factors played a major role in creating panic and depression. In the period surrounding the crisis, the major point of financial uncertainty was the status of the gold standard.¹⁰ This uncertainty resulted in an outflow of capital through the sale of American investments by foreigners. The loss of capital, together with the bankruptcy of several railroads, placed an unbearable strain on the banks, and they finally had to suspend. The volume of bank loans contracted, currency rose to a premium, and various substitutes for it were used.¹¹

The crisis passed rather soon but an unfortunate combination of monetary and fiscal factors kept the country in an unstable financial condition. The growing movement favoring free silver renewed the uncertainty regarding the maintenance of the gold standard.¹² At the same time, the Government found it increasingly difficult to stay on the gold standard. Because of a great amount of imports and a reduction of investments by foreigners in this country, there was an outflow of gold from the country. In addition to this outflow, a considerable amount of gold was being hoarded within the country because of the uncertain monetary situation.

The financial stringency of 1893 prefaced three and a half years of business depression similar to that which followed the crises of 1837 and 1873. By the end of the crisis year itself, a large number of busi-

⁸ For a description of the fall of many prominent men and firms in the crisis of 1884, see Collman, *Our Mysterious Panics*, pp. 132-150.

⁹ See Thorp, *Business Annals*, pp. 135-138; and Sprague, *History of Crises under the National Banking System*, pp. 124-215.

¹⁰ See Frank Weberg, *The Background of the Panic of 1893*, pp. 59-60. Washington, D. C.: The Catholic University of America, 1929.

¹¹ See Collman, *Our Mysterious Panics*, pp. 168-174.

¹² Weberg gives the silver-purchase policy a more direct place and claims that the inflation of currency through silver legislation with no assurance that it could be controlled, and with no method of contraction provided for, was an important cause of the panic of 1893 and of the years of depression that followed. Weberg, *The Background of the Panic of 1893*, p. 58.

ness and banking failures had taken place. The whole state of depressed business activity was beclouded by continued uncertainty regarding the maintenance of the gold standard and the results of the presidential election.

The turning point came in the latter part of 1896, when a number of favorable events improved the financial situation and paved the way for a business recovery. The uncertainty arising out of the presidential election was removed with the defeat of the Free-Silver party. A favorable movement in exchange rates reversed the outflow of gold, and an improvement in the Government's fiscal position permitted the Treasury to put an end to the loss of gold. Both agriculture and industry improved.

The crises of 1903 and 1907 and the period 1899-1913 ¹³

The crises of 1903 and 1907 were financial in their origin and had only brief repercussions on the economy as a whole. In this they resembled strongly the reactions that had occurred in 1857 and 1884. The financial difficulties of 1903 were largely a result of speculation in securities that had begun with a rise in stock values in 1897. During the period 1898 to 1902, a great trust movement was under way, and the country swarmed with promoters who were able to foist watered stock on an unsuspecting public. The reaction came in 1903, when some of the trusts failed. Apart from the steel industry, which suffered greatly, prices remained steady and business activity was affected only to a slight extent. The whole business recession had run its course by the end of 1904. As indicated in Figure 2, a favorable level of business activity was maintained in the years 1899 to 1902, and then a decline occurred in 1903 and 1904. The level of realized national income did not drop, although the rate of increase declined. There was an increase of \$1,200,000,000 from 1902 to 1903 and of only \$500,000,000 from 1903 to 1904.¹⁴ A brisk recovery then took place.

The overexpansion of the trust companies lay at the bottom of the difficulties in 1907 just as it had in 1903. The panic broke when the Knickerbocker Trust closed in October.¹⁵ A tight money market ensued, and all the characteristics of a banking crisis appeared. Call money advanced to 70 per cent.¹⁶ An indirect and favorable result of the unfavorable monetary developments was an increase in gold imports resulting from the premium on specie. The most noteworthy characteristic of the depression was its brief duration. As revealed by Figure

¹³ See Thorp, *Business Annals*, pp. 138-141; and Sprague, *History of Crises under the National Banking System*, pp. 216-320.

¹⁴ See Robert F. Martin, *National Income in the United States, 1799-1938*, p. 6. New York: National Industrial Conference Board, 1939.

¹⁵ Collman, *Our Mysterious Panics*, pp. 235-243.

¹⁶ See *Annals of the American Academy of Political and Social Science*, Vol. 31, 1908, p. 309.

2, however, the decline in business activity was quite severe. Industry and trade were stagnant, business failures took place, and there was widespread unemployment. Numerous railroads went into receivership, and foreign trade declined. Realized national income fell nearly a billion dollars from 1907 to 1908.¹⁷ Commodity prices fell from their high level of 1907 to a low in the summer of 1908.

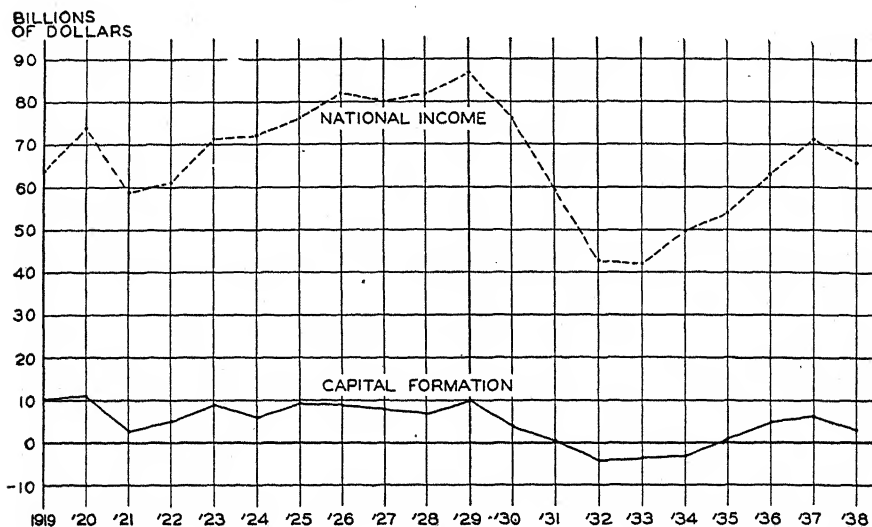


FIG. 3. National Income and Capital Formation, 1919-1938. Source of basic data: National Bureau of Economic Research (Kuznets).

The crisis itself was relieved in part by a number of Federal activities. The Government established a fund for extending credit and also authorized the issuance of clearinghouse loan certificates. The financial stringency passed by the end of the year, and in 1909 business revived and the country enjoyed mild prosperity. Then followed a recession in 1910, a mild recession in 1911, followed by revival and prosperity for the next two years. Prices also recovered in 1909 and rose to a peak in the spring of 1910. Then prices declined to a low level in May, 1911. Thereafter prices rose to the end of the period, and in 1913 the general level of wholesale prices was 34 per cent above 1899.

Prosperity and depression, 1922-1933¹⁸

The period between the post-war depression ending in 1921 and the introduction of new fiscal policies in 1933 includes the greatest peacetime

¹⁷ Martin, *National Income in the United States*, p. 6.

¹⁸ For the early part of this period, see Thorp, *Business Annals*, pp. 144-145; and for statistical data covering the whole period, see Simon Kuznets, *National Income and Its Composition, 1919-1938* (New York: National Bureau of Economic Research, 1941).

boom and the deepest depression in this country's history. The "Golden Twenties" from 1922 to 1929 raised the economy to unheard-of heights of business activity, only to be followed by a sharp drop to the depths of business inactivity and stagnation from 1929 to 1933.

The economy recovered quickly from the depression of 1920-1921 and experienced a cumulative improvement in business conditions up to 1929. The basis of the improvement lay in the amazing expansion of the modern motor-car industry, which gave impetus to the iron and steel trade. A business boom with subsidiary land booms and building booms resulted. National income rose from \$59,400,000,000 in 1921 to \$87,200,000,000 in 1929. Capital formation rose from \$3,300,000,000 in 1921 to \$10,000,000,000 in 1929. These statistics are plotted in Figure 3. Wholesale prices reached their post-war peak in 1925 and declined thereafter, except for a slight rally in 1928, as shown in Figure 4. Marked differences existed in the contributions made by various industries to the national income in this period of expansion.¹⁹ Manufacturing enjoyed fair prosperity, and profits rose, at a moderate rate but with considerable acceleration from 1928 to 1929. The improvement in manufacturing is reflected in the trend of factory payrolls and employment

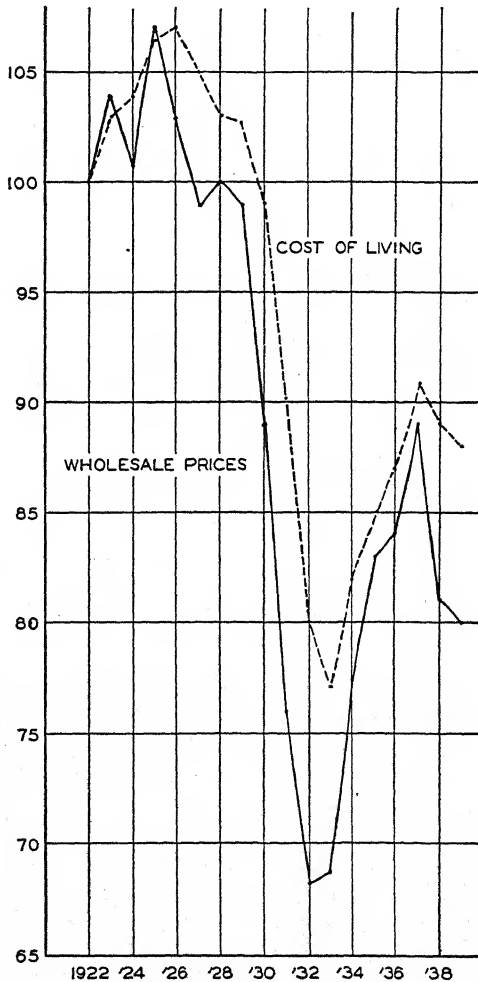


FIG. 4. Price Changes, 1922-1939 (converted to 1922 base). Sources of basic data: "Cost of Living," National Industrial Conference Board; "Wholesale Prices," United States Bureau of Labor Statistics.

¹⁹ See Kuznets, *National Income and Its Composition, 1919-1933*, p. 163, for the behavior of construction, trade, and other industries.

shown in Figure 5. The most important distinguishing feature of the developments in the field of agriculture during this period was the failure to achieve a recovery in any way comparable to the high level reached during the war. The main difficulty lay in the altered world-market situation.²⁰

The spectacular stock-market crash²¹ was followed by a rapid deterioration of virtually every branch of economic activity. The underlying economic conditions were such as to induce a downswing in business activity. The dislocations created by the First World War still existed in large part, and the world economy was likely to react unfavorably to

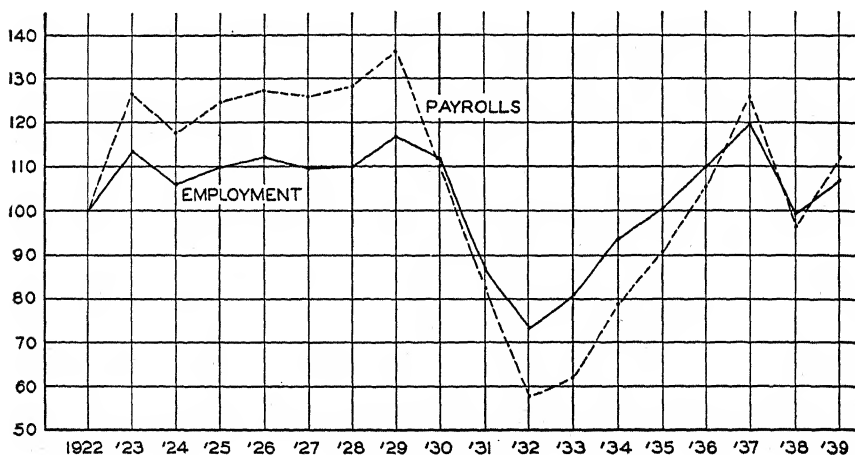


FIG. 5. Employment and Payrolls in Manufacturing Industries, 1922-1939 (converted to 1922 base). Source of basic data: United States Bureau of Labor Statistics.

shocks that might otherwise have had little effect. Other underlying factors weakening the economy's ability to withstand shocks may have been the rapid pace of technological change and the growing rigidities in segments of the price structure. Another factor, seriously suggested by some students of the period, is that at this time the short-, intermediate-, and long-term business cycles were due for a downswing.²²

The decline in business activity brought everything down with it.²³ National income dropped to \$42,900,000,000 in 1932 and to \$42,200,-

²⁰ See Vladimir P. Timoshenko, *World Agriculture and the Depression*, Michigan Business Studies, No. 5, p. 69 (Ann Arbor: 1933).

²¹ See National Industrial Conference Board, *Major Forces in World Business Depression*, p. 40 (New York: 1931); and Irving Fisher, *The Stock Market Crash—And After* (New York: The Macmillan Company, 1930).

²² For a concise discussion of these matters, see J. A. Estey, *Business Cycles: Their Nature, Causes and Control*, pp. 139-146. New York: Prentice-Hall, Inc., 1941.

²³ See Kuznets, *National Income and Its Composition, 1919-1938*; and D. Yoder and G. R. Davies, *Depression and Recovery* (New York and London: McGraw-Hill Book Company, 1934).

000,000 in 1933. Net capital formation dropped to -\$4,200,000,000 in 1932 but turned up slightly to -\$3,600,000,000 in 1933, thus anticipating the subsequent rise in national income.²⁴ Agriculture's contribution to national income dropped from its none-too-high level to \$2,800,000,000 in 1932, and agricultural exports also declined sharply in both value and volume.²⁵ The contribution of manufacturing to national income fell to \$6,300,000,000 in 1932, less than one-third of its 1929 level. Construction dropped to \$1,100,000,000 in 1932 and to \$700,000,000 in 1933. Unemployment rose at a rapid pace and early in 1933 stood at about 15,000,000. The country was paying dearly for the "new era."

Fiscal policy and economic activity, 1933-1939

The prompt handling of the banking crisis of 1933 and the initiation of New Deal measures of recovery and reform ushered in a new period, for peacetime, in which the Government played a prominent part in influencing economic activity. The main method involved was that of deficit-spending, although many regulatory devices were also designed to act in the same direction. Through relief, public works, agricultural subsidies, cheap money, and easy credit, the national income was forced up from its low level of 1932 and 1933. Between the beginning of 1935 and the middle of 1937, an unmistakable recovery was under way. During this period, in which fiscal policy was dominant, there also occurred the "downturn of 1937," which, although only a brief recession, was fairly acute.

The national income rose steadily from 1933 to 1937 and fell in 1938. Capital formation followed the same pattern and seemed to anticipate the decline in 1938.²⁶ Manufacturing experienced a remarkable recovery from 1932 to 1937, but was still 20 per cent below the 1929 peak and was even a little under the level of the immediate post-war depression in 1919. As a result of the "downturn of 1937," the 1938 figure was only 64 per cent of the 1929 amount. Agriculture had nearly as great a relative recovery as manufacturing from 1932 to 1937. It started leveling off sooner than manufacturing, and there was only a small increase from 1936 to 1937. The 1937 level was 82 per cent of the 1929 peak. Trade recovered sharply after 1933 and even continued increasing from 1937 to 1938, although at a slower rate than theretofore. Construction never recovered to anywhere near the level reached in the boom. In 1937 it reached only 44 per cent of its 1929 figure.

²⁴ Timing relations of this sort have been made the basis for designating capital formation as a primary causal factor in explaining income fluctuations. See A. H. Hansen, *Fiscal Policy and Business Cycles*, Chapter 2. New York: W. W. Norton & Company, 1941.

²⁵ See V. P. Timoshenko, *World Agriculture and the Depression*, p. 69.

²⁶ This is in line with the analysis, previously noted, that gives a prominent causal place to fluctuations in capital formation.

The improved level of business activity greatly reduced the rate of commercial failures between 1933 and 1937. There was some increase of failures in 1938, but after that the situation improved a little. Foreign trade recovered somewhat in the upswing, although it did not nearly approach the 1929 level. In the subsequent downturn, imports dropped sharply while exports fell only slightly. This fact demonstrates the mainly domestic nature of the downturn. Imports dropped in sympathy with the decline in national income, while exports, dependent in the first instance on foreign economic conditions, did not suffer so much. With the rise in domestic economic activity in 1939, imports also jumped. Exports, however, rose only slightly. Again the largely domestic nature of the recession and subsequent recovery is demonstrated.

There are some significant impressions to be gained from the national-income figures of the period. Agriculture and manufacturing responded to the increase in Government contribution from 1932 to 1933, but the other industries continued their decline. Then all private industrial groups continued their increase from 1934 to 1935 virtually unabated despite the decline in Government contribution. This fact strongly suggests the operation of a pump-priming factor, since economic activity in the private sphere continued its improvement after the stimulating effect of Government had been removed to a large extent. On the other hand, no such influence persisted from 1937 to 1938. Here almost all parts of the private sector of the economy suffered a decline while the Government contribution did not fall, although, to be sure, it slowed down almost to a standstill. The great decline in the rate of increase of the Government contribution might conceivably provide an adequate explanation through the "acceleration principle," broadly interpreted.

The relation between fiscal policy and economic activity during this period is shown more explicitly in Figure 6, which makes use of another set of statistics. Representing fiscal policy is the series known as "Total Net Income-Increasing Expenditures of All Governments,"²⁷ and representing economic activity there is a series based on the whole national income minus the share contributed by the Government.²⁸ Here can be seen particularly the sustained rate of increase in economic activity from 1933 to 1937, despite the fall in net Government income-increasing expenditures in 1935 and again in 1937. This evidence again tends to substantiate the conclusion that the Government contribution actually "took," that is, that private business was able to carry on under its own power for some time. The private sector was able to withstand completely the relatively small decline in the Government impact in 1935, but the drastic fall in 1937 showed its effects in due course.

²⁷ H. H. Villard, *Deficit Spending and the National Income*, p. 323. New York: Farrar & Rinehart, Inc., 1941.

²⁸ Kuznets, *National Income and Its Composition, 1919-1938*, p. 163.

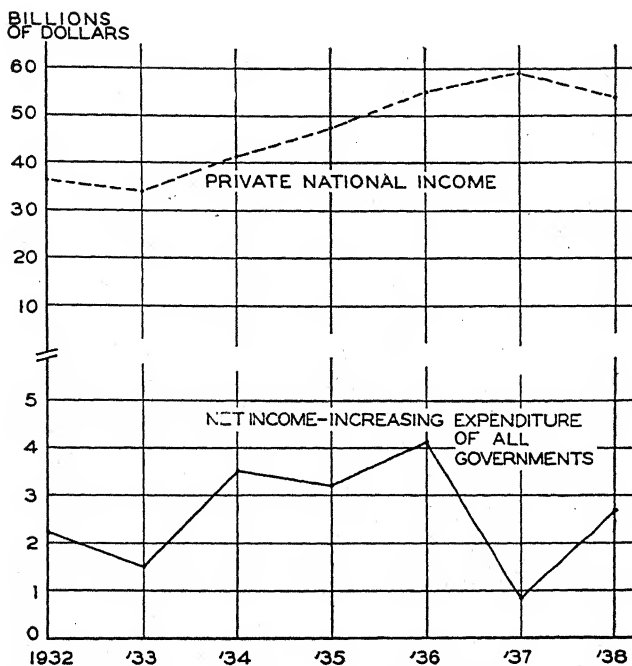


FIG. 6. Fiscal Policy and Economic Activity, 1932-1938. Source of basic data: "Net Income-Increasing Expenditures of All Governments," H. H. Villard, *Deficit Spending and the National Income*; "Private National Income (total minus government)," Simon Kuznets, *National Income and Its Composition, 1919-1938*.

The downturn of 1937 should not, however, be interpreted solely in terms of the decline in deficit-spending. The other major factors that have been suggested as contributing to the recession are:²⁹ the development of a number of bottlenecks and price increases, which resulted in some curtailment of economic activity; and an increase in reserve requirements leading to a reduction in member bank investments. As an underlying influence, there was also the fact that the recovery had been mainly one of consumption—both durable and nondurable—and the continuance of Government "investment" (since private investment was inadequate) may have been necessary to maintain the recovery. Nevertheless, the existence of a considerable lag between the drop in Federal deficit-spending and the drop in income has been taken as a reason for relegating the fiscal policy element to a secondary position.

²⁹ See J. W. Angell, *Investment and Business Cycles*, Chapter 12 (New York: McGraw-Hill Book Company, 1941); A. H. Hansen, *Full Recovery or Stagnation?*, Part IV (New York: W. W. Norton & Company, 1938), and *Fiscal Policy and Business Cycles*, Chapter 4 (New York: W. W. Norton & Company, 1941); and H. H. Villard, *Deficit Spending and the National Income*, Chapter 25.

This view holds that the recession might have been avoided by fiscal methods, but that the causes are probably the other two specified above. The recovery after the 1937-1938 recession is associated with an increase in deficit-spending (although the initiating factor is not clear), and, later, with the outbreak of the war.

The main cause of concern regarding the peacetime fluctuations of the economy lies in the severity of the most recent depression and the possibility that bigger and better depressions are in the offing. With the exception of the most recent depression (which is considered below), no such pessimistic conclusions seem warranted on the basis of the cyclical history of the American economy.⁸⁰ The main characteristic of this history is the prominent part played by monetary and banking instability. The progressive improvement in the monetary and banking structure of the economy augurs well in this respect. Another observation derived from cycle history is that the Government invariably played some part in relieving depressed conditions or in promoting recovery after a major reaction. And in every case the economy ultimately glided into a private-enterprise prosperity apparently with very little difficulty.

The depression following 1929 presents a special case, but the significant fact is that by 1937 the economy had, in a real and important sense, recovered from the deep depression that it had experienced. It had once more demonstrated its resilience. That this occurred only with the fullest assistance of Government mars the achievement only if something vital has been given up in the process—for instance, if the heavy Government debt incurred during this period comes to plague us at some later date, or if the private-investment economy has permanently lost its ability to supply a large volume of goods and services under its own power. Neither of these questions can be settled conclusively for some time, if ever. Owing to the war, it is particularly difficult to say whether the economy could have glided into a prosperity sustained by private industry alone. The issue will arise again when the war is over, and as an aid in dealing with this problem it is desirable to study the wartime booms and post-war reactions and the main trends of American economic development.

Wartime Booms and Post-War Reactions

Three major wars, the last of which is still in progress, have marred the period since 1860. All three strained the economy to the utmost, although only the most recent has been favored with the epithet "total

⁸⁰ See W. C. Mitchell, *Business Cycles, The Problem and Its Setting*, pp. 343-349 (New York: National Bureau of Economic Research, 1927); and A. R. Eckler, "A Measure of the Severity of Depressions, 1873-1932," *Review of Economic Statistics*, May, 1933.

war." In every case the required transition was drastic and a large part of the national income had to be diverted from civilian purposes to the prosecution of the war. Yet the economic growth that took place in the interim between wars and, perhaps, the lessons learned from historical experience have altered the nature of the impact that each of these wars has had on the economy.

Impact of the War Between the States on the American economy: 1860-1865³¹

In the War Between the States, the American economy was broken in two, and each incomplete part had to try to mobilize its resources for war against the other; then, after the war, the two parts had to be knit together again and jointly readjusted to peacetime conditions. Except for the stimulus given to mass-production industries and the corporate form of business organization,³² the North underwent no profound structural changes during the war, although there were some short-run changes of considerable importance.³³ At the beginning of the war, there was the peculiar phenomenon of a business decline instead of the usual improvement. Both businessmen and the public were cautious in their buying, with a resulting reduction in the income flow. Then, when the die was cast and Government spending began on a large scale, there was an increase in income, a fuller utilization of resources, and a general state of prosperity. All branches of industry and trade gained in this early stage of the war: manufacturing and farming, mining and commerce.³⁴ Even trade with the South persisted in some degree by means of smuggling. Banking suffered disruption in the early stage of the war, as did other branches of economic activity, and some banks even had to suspend specie payments. In the subsequent period of prosperity, however, especially after the establishment of the national banking system, there was an expansion and improvement in banking organization.

The financing methods of the Federal Government constituted a disruptive element. Expansionary elements existed in the expenditures financed by an unsatisfactory tax structure and borrowing program. This was bad enough, but the outright printing of money in the form of "greenbacks"³⁵ constituted an expansionary influence in its entirety and

³¹ Thorp, *Business Annals*, pp. 127-129.

³² This structural change is emphasized in Edgar W. Martin, *The Standard of Living in 1860*, p. 5 (Chicago: The University of Chicago Press, 1942).

³³ E. D. Fite, *Social and Industrial Conditions in the North During the Civil War*. New York: The Macmillan Company, 1910.

³⁴ For a full discussion of the developments that took place in each of these industries during the war, see Fite, *Social and Industrial Conditions in the North During the Civil War*.

³⁵ The following excerpt from a letter written by President Lincoln to his friend Colonel Taylor deserves a place in the theory as well as the history of money:

"My dear Colonel Dick, I have long determined to make public the origin of the greenback and tell the world that it is Dick Taylor's creation. You had always been friendly to me, and when troublous times fell on us, and my shoulders,

contributed greatly to the inflationary rise in prices that took place.³⁶ This rise in prices exceeded the peak reached in the War of 1812 but fell short of that reached during the Revolutionary War. Fiscal policy as a whole had the effect of releasing purchasing power through Government expenditures in excess of the absorption of purchasing power through taxes and loans that cut down spending. The difficulties involved in obtaining supplies was an additional aggravating factor. The price increase that took place had the usual effect of creating disparities in the distribution of national income—an increased income that was created by the Government expenditures and by the resulting stimulus to private spending. In the international sphere, the position of the North was strengthened, if anything, by the war. Exports of foodstuffs were substantially maintained³⁷ and imports declined a little. At first there was a net capital outflow, but during the course of the war, when it became evident that the South could not win and the North could not lose, a capital inflow took place. The relation between fiscal policy and business activity during these years is indicated in Figure 7.

The South suffered serious dislocations during the war, much more so than the North, since the South had typically had an open economy, specializing in the production of exportable staples and dependent on international trade. The products exported, mainly tobacco and cotton products yielded by a plantation-slave economy, were traded for foodstuffs and manufactured goods, in which this area was deficient. With the outbreak of war, the exports of the South were cut off and depressed industries immediately appeared. From the point of view of the war effort, the curtailed exports, taken by themselves, were desirable in hasten-

though broad and willing, were weak, and myself surrounded by such circumstance and such people that I knew not whom to trust, then I said in my extremity: 'I will send for Colonel Taylor; he will know what to do.' I think it was in January, 1862, on or about the 16th, that I did so. You came, and I said to you: 'What can we do?' Said you: 'Why, issue treasury notes bearing no interest, printed on the best banking paper. Issue enough to pay off the army expenses and declare it legal tender.' Chase thought it a hazardous thing, but we finally accomplished it, and gave the people of this republic the greatest blessing they ever had—their own paper to pay their own debts." [Taken from Emil Ludwig, *Lincoln*, Boston: Little, Brown & Company, 1930.]

³⁶ At the same time that the greenbacks were issued, the Government was "hoarding" gold. "The first step we are bound to take is to relieve the Government from the mischievous position of being a hoarder of gold. It cannot afford to be an instrument in the hands of its enemies, a participator in the depreciation of its currency, a party to the speculations of the sea-board . . . The second step should be to allay the public fears as to the value and extent of the legal-tender issue. The amount is but \$400,000,000, not \$1,000,000,000. Instead of an unlimited issue hereafter, not one dollar more should be added; but, on the contrary, the amount in circulation should be reduced, and a more enlarged system of taxation established." [From a speech by the Hon. Henry G. Stebbins in the House of Representatives, March 3, 1864, reprinted in *Finances and Resources of the United States*. New York: Loyal Publication Society, 1864.]

³⁷ In 1860, 1861, and 1862 there were crop failures in Great Britain, and in one of these years a crop failure in Europe. See Fite, *Social and Industrial Conditions in the North During the Civil War*, p. 17.

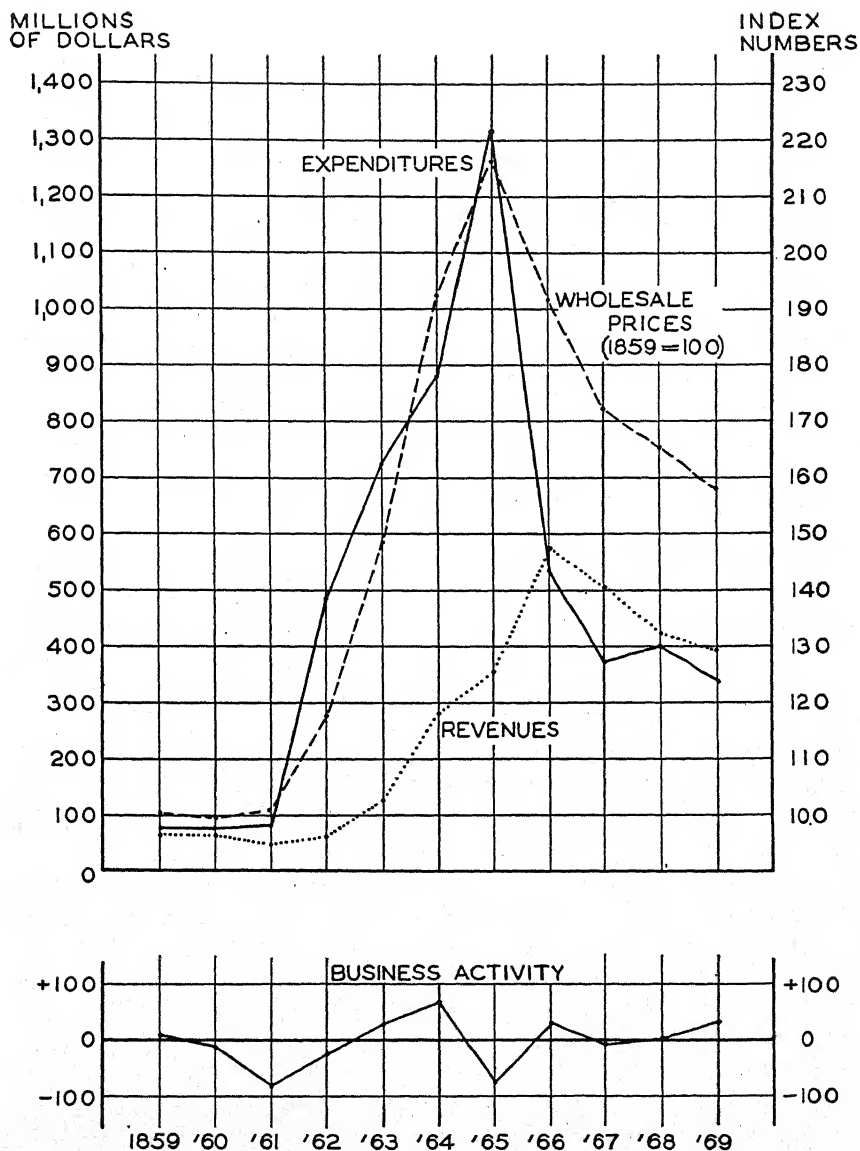


FIG. 7. Fiscal Policy and Business Activity, 1859-1869. (Expenditures and revenues in fiscal years; wholesale prices and business activity in calendar years.) Sources of basic data: "Expenditures" and "Revenues," United States Treasury Department; "Wholesale Prices," United States Bureau of Labor Statistics; "Business Activity," Cleveland Trust Company.

ing diversion of men and resources to military service and production. The diversion to war production took place very slowly, however, because the slaves were not readily adaptable to nonplantation methods. The Government's purchasing policy, involving requisitions below the market price, had the effect of discouraging production. Since the major part of imports for both civilian and military purposes was cut off, the development of diversified farming and manufacturing became an absolute necessity. The only redeeming feature in the South's situation was the prevalence of smuggling through the North's blockade.

The financial methods adopted by the South did not tend to reduce the economic disruption, and in this respect they were similar to those of the North. Resort was had to excessive currency issues, and the Confederacy lacked the power and the will to use taxes to absorb the purchasing power that it released through its expenditures. This, taken together with the restricted supply of goods, resulted in a rise in price and a decline in the buying power of the Confederate currency.

Post-war reconstruction ³⁸

The end of the war necessitated a sharp readjustment in the North. War demands had overexpanded both manufacturing and agriculture. A much lower level of activity was adequate for peacetime purposes. On the financial side, the great public debt that had been incurred necessitated a heavy transfer burden of taxation, and the depreciated fiat money, still in circulation, left a legacy of problems. Government expenditures dropped sharply from \$1,300,000,000 in 1865 to \$536,000,000 in 1866, while tax revenues rose from \$348,000,000 to \$572,000,000 and a surplus developed. As for the South, the severe disruptive effects of the war, added to the fact of military defeat, left a very different economy at the war's end. Its manpower potential was greatly reduced, since a large number of the white males had been killed. The slave labor was, unfortunately, adaptable only to certain types of production. Actual physical destruction of productive property was added to the economic dislocation caused by the war, and aggravated the post-war problems of the South.

Economic activity for the country as a whole was not too greatly affected by the post-war readjustment. Wholesale prices fell sharply in 1865 and then declined less rapidly until 1871. Nevertheless, at the later date prices in general were still about 35 per cent above their pre-war level. The effect on business conditions was not very severe. Such reaction as took place in the years 1865 to 1867 is not entirely traceable to the war, but arose partly out of financial difficulties in England during the year 1866. In the interval between this short reaction and the end

³⁸ See Thorp, *Business Annals*, pp. 129-131.

of the decade, the country enjoyed fairly prosperous business conditions.

Economic changes during the First World War: 1914-1918³⁹

In the First World War the American economy was severed from one part of the world economy and was allied with the other part in destroying the common enemy. The war years, 1914-1918, had a very uneven effect on the country as a whole. A panic and depression at the outbreak of war were turned into a period of prosperity when the temporary maladjustments were corrected and when it became evident that the war would last for some time. Then the United States' entry into the war propelled the economy into wartime boom and inflation. During this war period the country exhibited great sensitiveness to influences exogenous to the private domestic economy, both from foreign countries and from the Government.

The general state of indecision that prevailed because of uncertainty regarding the length of the war hampered business during the major part of the first two years of war. This unsettled condition may be seen in the low level of the index of business activity in 1914 and, to a lesser extent, in 1915,⁴⁰ as shown in Figure 8. Then, in the summer of 1915, when it became evident that at least another year of war was to be expected, business activity improved on the basis of war orders. The actual entry of the United States into the war brought with it new financial as well as military responsibilities. It was necessary to furnish funds to support the war effort of this country and of the Allies. Here again, as in preceding wars, the Government resorted to inflationary finance. The great release of purchasing power through expenditures was only in small degree offset by the taxation and borrowing program, which impinged very slightly on consumer purchases. The taxes in force⁴¹ had only a small effect in the direction of reducing purchases; and the borrowing, which financed two-thirds of the expenditures, was facilitated to a great extent by credit expansion.⁴² The amount of hand-to-hand currency also increased.⁴³ The inflationary fiscal policy therefore in-

³⁹ See Thorp, *Business Annals*, pp. 142-143; E. L. Bogart, *Direct and Indirect Cost of the Great World War* (Carnegie Endowment for International Peace, *Preliminary Economic Studies of the War*, ed. by David Kinley, No. 24, New York: Oxford University Press, 1919); J. M. Clark, *The Costs of the World War to the American People* (New Haven: Yale University Press, 1931); and B. M. Anderson, Jr., *Effects of the War on Money, Credit and Banking in France and the United States* (Carnegie Endowment for International Peace, in the series cited above, No. 15).

⁴⁰ See Clark, *The Costs of the World War to the American People*, p. 22.

⁴¹ See Bogart, *Direct and Indirect Cost of the Great World War*, p. 170.

⁴² For a full discussion of public finance during this period, see Chapter 29 by Catherine Ruggles.

⁴³ See Anderson, *Effects of the War on Money, Credit and Banking in France and the United States*, Chap. 16.

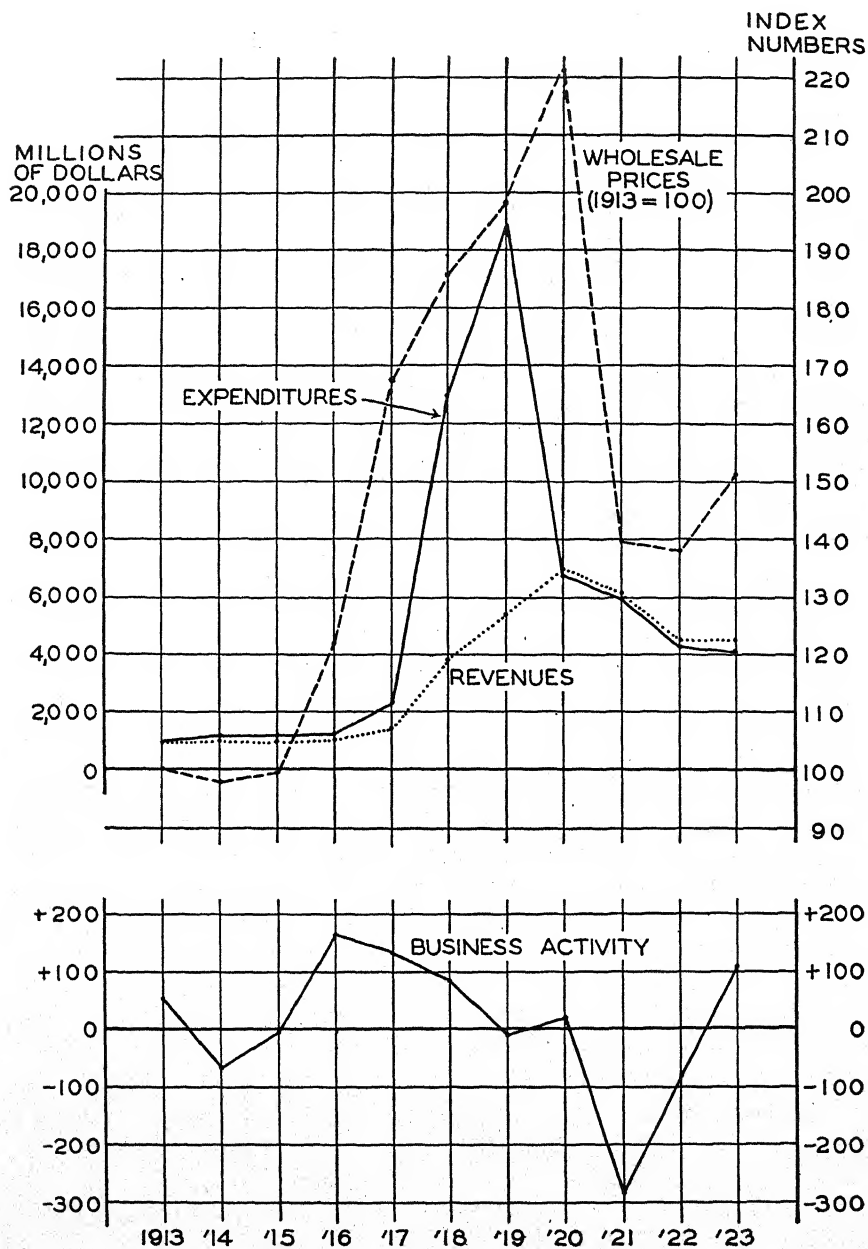


FIG. 8. Fiscal Policy and Business Activity, 1913-1923. (Expenditures and revenues in fiscal years; wholesale prices and business activity in calendar years.) Sources of basic data: "Expenditures" and "Revenues," United States Treasury Department; "Wholesale Prices," United States Bureau of Labor Statistics; "Business Activity," Cleveland Trust Company.

creased the total amount of currency and deposit money and, under the conditions of limited civilian production, resulted in a great increase in prices. The relation between fiscal policy and business activity is suggested by Figure 8.

At the war's end in November, 1918, wholesale prices were more than twice as high as they had been in 1913.⁴⁴ The Government regulation of prices was evidently of little avail in the face of the fiscal methods adopted. The great price increase that took place from 1915 to 1919 continued for another year despite the decline in the Government contribution to national income: evidently private spending more than supplanted Government spending. Business activity improved from 1919 to 1920, after a steady decline during the course of the war following the peak reached in 1916.⁴⁵

Post-war readjustments ⁴⁶

The return to peacetime conditions was expected to bring the usual depression and price deflation. These expectations were confirmed for a short time in the early part of 1919, when general business uncertainty prevailed and a fall in prices of some goods took place. This was a false

⁴⁴ Anderson points out that wholesale prices doubled while the labor force available for producing ordinary civilian goods and services was cut in half. Neither the cost of living nor retail prices in general rose as high as wholesale prices. See Anderson, *Effects of the War on Money, Credit and Banking in France in the United States*, pp. 200-201.

⁴⁵ The years 1916 and 1917 were both highly prosperous, and the level of activity in 1917 was only slightly below that of 1916. Such decline as took place may possibly be attributed to reorganization of industry for war, shortages of fuel and labor, freight congestion, a tightened money market, and various wartime restrictions on domestic and foreign trade. In 1918 there was clearly a recession, attributable to an accentuation of the preceding factors. (See Thorp, *Business Annals*, p. 143.) The level of production might be expected to have increased after 1916, because production activity, particularly in wartime, is not so greatly affected by the state of trade as is the level of business activity. Realized production income, adjusted by the general price level, rose a little from 1916 to 1917 (Robert F. Martin, *National Income in the United States*, p. 11), but an index of physical output of all manufacturing industries combined shows a slight decline (Solomon Fabricant, *The Output of Manufacturing Industries, 1899-1937*, p. 44. New York: National Bureau of Economic Research, 1940). The two sets of figures are given below for the period 1914-1919:

	Realized Production Income Adjusted by General Price Level (Martin) (In billions of 1926 dollars)	Physical Output of All Manufacturing Industries Combined (Fabricant) (1899 = 100)
1914.....	50.8	186
1915.....	51.4	218
1916.....	54.1	259
1917.....	54.8	257
1918.....	59.8	254
1919.....	59.9	222

⁴⁶ See Thorp, *Business Annals*, pp. 143-144, and Clark, *The Costs of the World War to the American People*, pp. 52-68.

alarm, however, because a short but intense boom developed. The cessation of the demand for war materials was offset by civilian demand for both consumption and investment purposes. This fact is indicated by the continued rise in income. Realized national income in current prices rose from \$62,900,000,000 in 1919 to \$68,400,000,000 in 1920.⁴⁷ The sale of consumption goods was stimulated by the European need for foodstuffs and by postponed domestic demand for both durable and nondurable goods. Investment was facilitated by low interest rates, which formed part of the Treasury's policy of maintaining "easy money" conditions to keep down the cost of Treasury borrowing. Private borrowing from the banks increased, and in the period from the last quarter of 1919 to the middle of 1920 loans and discounts of all banks showed an increase of nearly \$6,000,000,000, or nearly 25 per cent.

So active was this post-war boom that a severe inflation developed, as may be seen in Figure 8. Government regulation of prices was abandoned at a time when underlying inflationary pressure persisted. As a result, the price level reached a peak that even exceeded that attained during the war. Not even in the War Between the States had such a sharp price increase taken place; it is necessary to go back to the War of 1812 for a comparable situation.

The boom did not last long, however, and several signs of trouble soon appeared. The great and rapid price increase led to what has been called a "buyers' strike"—consumers held off until prices should reach a more reasonable level. This condition led to excessive business inventories and price cutting. As reconstruction measures rehabilitated European countries, or as these countries ran out of borrowed funds, exports also dropped and the whole economy suffered. On top of all this, the credit situation grew threatening. Banks were reaching their reserve limits despite the Federal Reserve System's easy money policy and the large gold inflow. When the major part of the Treasury financing was over, by November, 1919, the Federal Reserve System took steps to tighten credit and raise interest rates. The rediscount rate was raised at first slightly and then rapidly in January and May, 1920. The combination of all these circumstances ended the boom early in the summer of 1920.

With the boom at an end, the wholesale price level fell sharply. The inflationary bubble had been pricked. There took place the sharpest drop in our history, with the possible exception of prices in terms of Continental currency after the Revolutionary War.⁴⁸ Farm prices were hardest hit of all. The ensuing business depression was severe, although the banking situation generally was good. Realized national income fell

⁴⁷ Robert F. Martin, *National Income in the United States*, p. 7.

⁴⁸ The extensive decline in price after the War of 1812 took place, it will be recalled, over a period of about five years.

from \$68,400,000,000 in 1920 to \$56,700,000,000 in 1921, and commercial failures reached a new peak. The postponed reaction to wartime conditions had set in.

Since the country's wars have been growing more and more severe, the American economy has been called upon to make greater and greater wartime and post-war adjustments. The War Between the States, the First World War, and now the Second World War have all introduced severe strains. They have had one common characteristic: the failure to employ noninflationary methods of war finance. The greenbacks and Confederate currency of the War Between the States and the "invisible greenbacks" of the World Wars provided the basis for a great and rapid rise in prices. This increased the money cost of war, thus aggravating wartime and post-war fiscal problems, and had uneven and inequitable effects on living standards in different parts of the economy.

There is one significant difference between the War Between the States and the First World War that may be suggestive of possible developments after the present war. Although the economy recovered quickly in both cases, an intense boom and inflation developed soon after the World War. The combination of postponed demand and stored-up purchasing power provided the basis for this situation. An excessive price rise took place, however, and had the effect of dampening the favorable effects of the boom and aggravating the subsequent reaction. This sequence of events indicates some factors to look for and guard against in the period immediately following the present war. The basis for a high level of activity will exist, but it must not be permitted to go out of bounds and it must be made to last. The solution lies in continuing for a while the wartime methods of controlling economic behavior. An armistice or a peace ends only military warfare—the war economy persists for some time. This is the main post-war lesson to be learned from the past.

Economic Trends

An examination of the trends in the economy's performance during the period since the War Between the States centers around the study of various measures of economic activity and economic well-being. The most valuable and at the same time the most difficult of such measures is the "standard of living." An enumeration of the material goods and services enjoyed by a representative American family in 1860 and a comparison with the condition of a corresponding representative family of 1930 (or thereabouts) is only the first step in making generalizations about the trend in the standard of living. Even if a "representative" family could be defined and discovered, the difficulty immediately arises that the standard of living is somehow related to the satisfactions derived

from the enumerated goods and services. Is it possible to compare the satisfactions derived from two different sets of goods and services consumed at two widely separated dates? Such inter-temporal comparisons of utility are extremely difficult for a single individual even when the length of time involved is short and the items considered remain the same. The difficulties are multiplied many times when instead of the single individual there is a changing group of many individuals, when the time lapse is of considerable length, and when the commodities and services consumed are radically different. The subject is too indefinite to lend itself readily to economic analysis.⁴⁹

This section must confine itself to a less ambitious project than that of determining the change in the standard of living. The analysis is confined to objective indicators of the trends in the performance of the American economy. Two main groups of such indicators are considered: (1) national income per capita and the composition of the national income; (2) length of the working day and length of life. The first gives us some indication of the quantity and composition of goods and services available to the members of the community. The second suggests the length of time that people have in which to enjoy these goods and services.

National income and its composition

The best objective measure of the performance of the American economy is the real income per capita, that is, the average amount of goods and services available. However dangerous averages may be, they nevertheless aid in obtaining an indication of changes in the item that they represent. Figure 9 shows the fluctuations in realized national income per capita in constant (1926) dollars.⁵⁰ Real income per capita evidently has risen greatly in the era since the War Between the States.

The figure in 1859 was \$300, while the figure in 1938 was \$531. Al-

⁴⁹ For a highly courageous and successful attempt to obtain concrete results in this field, the reader is referred to Chester W. Wright, *Economic History of the United States*, Chapter 45. New York: McGraw-Hill Book Company, 1941.

"If we are to approach economic history by way of the standard of living, how are we to measure economic progress? Can we reduce the standard of living . . . at any one time to an index number and focus our attention on the trend of these index numbers? Our desire to be 'scientific,' to avoid vagueness and abstraction, makes this tempting. Such index numbers, however, become meaningless if comparisons are to be made between levels of living widely separated in time or space: qualitative differences are as significant as quantitative differences. What sort of index number could we use to compare the level of living in 1860 with that of 1940? In 1860 there were no telephones, radios, electrical refrigerators, washing machines, vacuum cleaners, or electric lights, no automobiles and no hard-surfaced roads. The list of consumers' goods which are in common use now but were not available to anyone in 1860 is a long one, and expenditures on these goods now make up a large part of consumers' expenditures." (Edgar W. Martin, *The Standard of Living in 1860*, pp. 2 and 3.)

⁵⁰ The data are taken from Robert F. Martin, *National Income in the United States*, pp. 6-7. Income figures are deflated by an index of the general price level. Realized national income is not quite the same as the total of goods and services available, but is a sufficiently close approximation for the purposes of this analysis.

though these two years are not strictly comparable in terms of cycle phase, they nevertheless are representative of the rise that has taken place. This great rise did not take place without rather violent fluctuations. There was a substantial drop in real income per capita from 1859 to 1869, the figure for the later year being \$233. There was then a steady

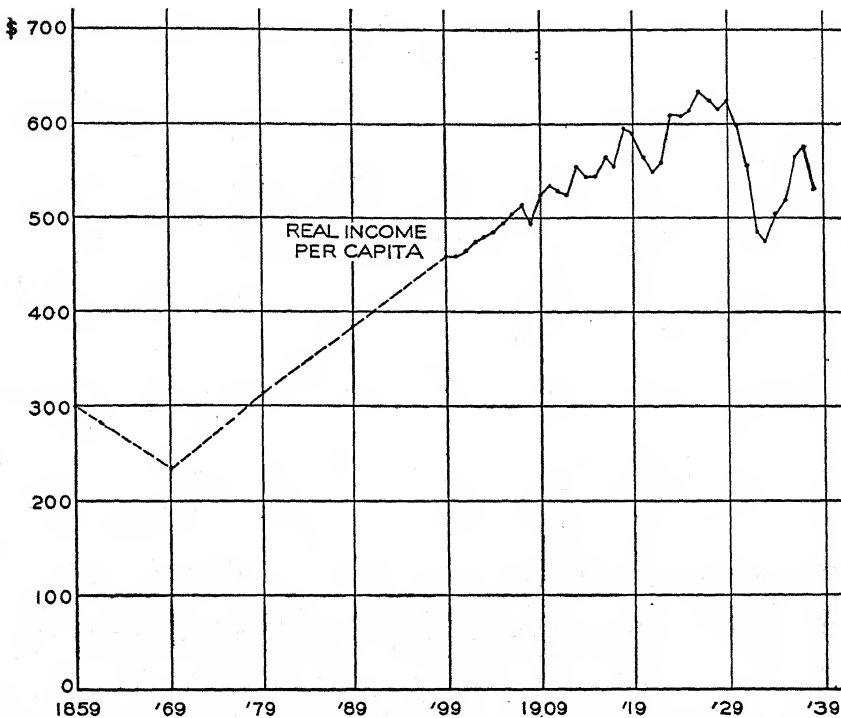


FIG. 9. Real Income Per Capita. Source: Robert F. Martin, *National Income in the United States, 1799-1938*, pp. 6-7. New York: National Industrial Conference Board, 1939.

growth in terms of decades to the end of the century, and then, after minor fluctuations, a pre-war peak of \$557 was reached in 1913. After a slight decline during the war, a post-war peak of \$631 was reached in 1926. The great depression brought the figure down to \$472 in 1933, and the subsequent improvement in economic activity raised it to \$570 in 1937. The rise in real income per capita over the period as a whole was therefore by no means continuous.

Since one test of the performance of an economy is its ability to recover from serious internal and external shocks, it is important to consider more fully the behavior of real income per capita before and after serious wartime or peacetime disturbances.⁵¹ It was noted above that

⁵¹ Owing to the nature of the data, it is not possible here to insure a comparison between corresponding cycle phases.

the decade of the War Between the States left the economy worse off than before in terms of real income per capita, a decline having taken place from \$300 in 1859 to \$233 in 1869. In the following decade, however, the economy improved greatly despite the crisis of 1873 and the prolonged depression that followed it. Real income per capita in 1879 stood at \$315. The crises of 1884 and 1893 likewise failed to impair the growth of the economy, the figure for 1889 being \$385 and for 1899, \$456. Similarly, the decade that saw the crises of 1903 and 1907 ended with a real income per capita of \$530 in 1909. And the decade that suffered through the Great War ended with a real income per capita of \$592 in 1919. The immediate post-war reaction took place in a decade that showed an increase to \$625 in 1929. The decade of the great depression, however, altered the continued progress that had taken place. In no year during that decade did real income per capita reach \$600.⁵² Can this mean that the American economy has marred its record of performance—its continuous progress in real income per capita, decade by decade? ⁵³ This is perhaps the most important problem in the consideration of the performance of the American economy. It is necessary to examine the composition of the national income and seek some clue to the alteration of trend in real income per capita.

The most significant development in the composition of the national income lies in the changing relative importance of consumers' outlay and capital formation. There is no consistent trend for the whole period, but rather a sharp alteration of trend in the latter part of the period. In view of the crucial importance of capital formation in the maintenance of a high level of income and employment, any such change in trend deserves the most careful attention.

It can be seen from Figure 10 that gross national product increased by increasing amounts every decade with the exception of the most recent one.⁵⁴ The villain of the piece appears to be gross capital formation, which rose every decade from 1879 to 1928 but actually declined in the decade 1929–1938. The consistent upward trend to 1928 is clearly broken in the 1929–1938 decade. Consumption rose throughout the period, although the rate of increase slowed down in the last decade. Since a decline in the rate of increase of consumption is here associated with an actual decline in capital formation, there is some possibility that the acceleration principle was in operation and that the change in behavior

⁵² The figure for 1939 is not available, but other physical indices suggest that it at least did not exceed the 1929 figure.

⁵³ The decade of the War Between the States constitutes an exception to the record of continuous progress. Several exceptions also exist in the era before that war.

⁵⁴ Figures taken from Kuznets, *Capital Formation, 1879–1938* (mimeographed, 1941).

of national income may actually be traced to the behavior of consumption.

The change in trend is even more evident when percentage figures are used. In the five decades from 1879 to 1928, the share of gross capital formation in the national product did not fall below 20 per cent. In the decade 1929-1938, however, the figure fell to 15 per cent. Thus, in the decade 1929-1938 the economy was much more a "consumption" economy

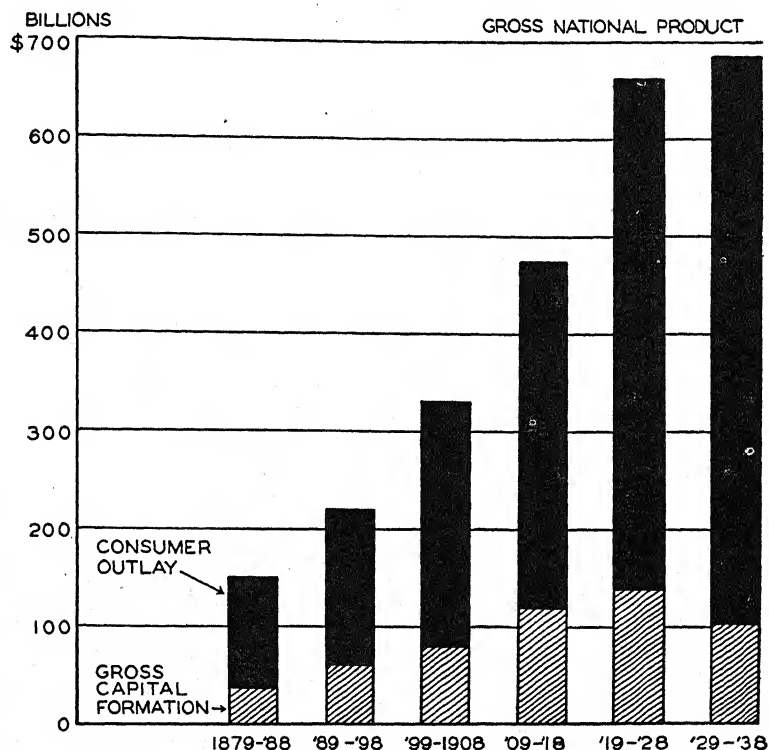


FIG. 10. Gross National Product and Its Components, by Decades, 1879-1938. (Values in 1929-1938 prices.) *Source of basic data:* Simon Kuznets, "Capital Formation, 1879-1938" (mimeo.).

than it had been before. In the past, a larger part of the real income per capita consisted of goods to be used for the production of other goods and not to be used for immediate consumption. Thus the leveling off in real income per capita, suggested by Figure 9, does not necessarily represent an immediate decline in rate of increase of consumption per capita; but it might presage a decline in rate of increase in income-producing wealth, and thus in the output of consumers' goods at some future date.

Length of working day and length of life

One of the most reliable and persistent trends in factors affecting the standard of living since the War Between the States is that which has taken place in the length of the working day.⁵⁵ About 1860 some of the stronger crafts had secured a 10-hour day, but most city workers had longer hours; the same was true of those in factories.⁵⁶ Seventy hours a week was probably fairly typical. By 1870 the 10-hour day was the rule in crafts, but employees in bakeries, transportation, cotton mills, and others worked 11 to 14 hours. Two decades later, the carpenters won an 8-hour day in 137 cities and a 9-hour day in most other places.

In 1909, 76 per cent of the workers in manufacturing industry worked from 54 to 60 hours a week, and 8 per cent worked over 60 hours. During the Great War, labor organizations grew in strength, and the War Labor Boards favored shorter hours. In the post-war boom, the workers were in a strategic position and gained greatly in bringing about shorter hours.⁵⁷ As time went on, the working day became shorter in many industries, and by 1930 something like 20 hours a week had been added to the leisure time of the average man as compared with the situation in 1860. By 1940 probably from 3 to 10 additional hours' leisure time weekly had been gained in some occupations.⁵⁸

An increase in the number of legal holidays also took place, and vacations became much more common among the great mass of the population. Compulsory education meant that the average child did not begin full-time work until he reached the age of 16 or 18 years. Social security legislation increased the number of people financially able to retire before death. Finally, the expectation of life at birth has increased greatly. Figures based on Massachusetts experience show an increase from 38.7 years in 1855 to 58.1 years in 1929 for males and from 40.9 years in 1855 to 61.4 years in 1929 for females.⁵⁹ Indications are that by 1940 the expectation of life at birth had been lengthened to 60.6 years for men

⁵⁵ See L. T. Beman, *Five Day Week* (New York: H. W. Wilson Company, 1928); and *The Five-Day Week in Manufacturing Industries* (New York: National Industrial Conference Board, 1929).

⁵⁶ Dr. Martin points out that the average working day in 1860 was around 11 hours. (Edgar Martin, *The Standard of Living in 1860*, p. 343.)

⁵⁷ See the table given in Beman, *Five Day Week*, p. 44.

⁵⁸ Average weekly hours in manufacturing reached 41.1 in December, 1936. By January, 1938, factory hours had receded on an average to 33.3 per week. Improvement in conditions began in the fall of 1938, and by December, 1940, when overtime conditions prevailed in many defense industries, factory hours reached an average of 29.8 per week. (*Hours and Earnings in the United States, 1932-1940*, Bulletin No. 697, Bureau of Labor Statistics, pp. 4-7).

⁵⁹ Warren S. Thompson and P. K. Whelpton, *Population Trends in the United States*, p. 240. New York: McGraw-Hill Book Company, 1933. See also Louis I. Dublin and Alfred J. Lotka, *Length of Life*. New York: The Ronald Press Company, 1936.

and to 64.5 years for white women.⁶⁰ Virtually all of the increase in the expectation of life at birth is attributable, however, to a reduction in infant mortality rather than to an actual increase in the length of life for adults.⁶¹

The general conclusion to be derived from these figures is that the increase in real income per capita has been coupled with a reduction in the hours of work and a lengthening of life. Leisure time has increased, and there has been a greater amount of goods and services available for enjoyment during the leisure time. More output per capita has been produced with a smaller number of hours of effort per worker. Although temporary setbacks have been suffered in time of war or serious peacetime disturbance, the improvement in the material basis for a higher standard of living has continued. A fundamental, and perhaps foreboding, change has taken place, however, in the last decade. Capital formation has declined in relative importance in the national income. In terms of the immediate standard of living, the implication of this is not unfavorable; the serious problem lies in the significance that the change might have for the standard of living in the future.

Conclusions

The outstanding conclusion to be drawn from the foregoing discussion of wartime and peacetime fluctuations and long-time trends is that the American economy has demonstrated an abounding resilience. In spite of serious internal and external shocks, there is an almost continuous record of growth. This is true to a large extent even of the most recent period, around which some of the most heated controversy rages. The conditions surrounding the progress that has taken place have changed radically, however, and our real lessons can be learned from these conditions rather than merely from their results.

The crash of 1929 pulled down with it some of the generalizations based on the preceding era. The long-time trend of progress was altered in rate and in composition. The consistent growth of manufacturing compared with agriculture remained, but national income barely held its own and capital formation actually lost out. Fiscal policy played a greater and greater part in influencing economic activity—for better or (some would say) for worse. Here more than ever it is difficult to disentangle effect from cause. Whether the private sector of the economy must be given the lion's share of blame for the crash, and whether the Government sector must be given at least some share of credit for

⁶⁰ Edgar Martin, *The Standard of Living in 1860*, p. 220.

⁶¹ Edgar Martin, *The Standard of Living in 1860*, p. 220. Dr. Martin also points out that in 1879 the expectation of life at 60 was 14.80 years for males and 16.10 years for females, while in 1929 it was only 14.01 years for males and 15.35 years for females.

the recovery is not so important. The main question is whether the recovery would have been quicker or "healthier," or both, if the Government had not intervened so fully. Basically, the question is whether the economy has undergone a profound change—whether it has reached a state of maturity and perhaps stagnation. Those favoring a continuation of fiscal and other intervention by the Government say that past progress has been geared to a rapid population growth and the development of heavy industries—such as railroads and automobiles—and that neither of these conditions will persist in the future; those who favor a reversion to the pre-depression state of affairs can point to the fact that, one way or another, the economy has recovered and progressed in the past. The record of the New Deal period is used by one side to indicate the necessity of continued Government intervention and by the other to demonstrate the dire consequences of interfering with the natural behavior—the ups and downs—of free enterprise.

The issue between these two opposing points of view is still currently acute; it has political connotations, and this is not the place to press the author's point of view. More important, however, than distributing praise or blame for past events is insuring a favorable state of business activity in the future. Whether the Government's steps have been for good or ill, one thing is certain—those steps cannot be retraced. The economically and, in some cases, politically strong groups that exist today cannot suddenly be removed. That being the case, fiscal and other Government intervention cannot suddenly be eliminated without calamitous consequences. In such circumstances it seems unavoidable (regardless of whether it is desirable) that the Government should stand ready to fill the post-war gap in case enterprise is inadequate. In view of the virtually unalterable rigidities that have been set up, even those economists who are generally in favor of severe business reactions in order to readjust the price structure and lay the basis for healthy recovery must yield. A high level of national income and employment must be maintained. This may involve Government spending, but not necessarily *deficit*-spending, since a high level of national income has a high taxable capacity. The implementation of such a policy would seem to be the only desirable course to pursue in the post-war period, whether the policy is regarded as merely making the best of a bad job or as the continuation of a good job well done.

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